amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

MAY, 1973

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COVER
The Eddystone Point lightstation on the N.E. tip of Tasmania — see article "Fractured Bones and Little Yabbies on a Lighthouse" by VK7FB/T.

QSP

GOLDEN JUBILEE

It was 50 years ago this July when a group of young wireless enthusiasts got together and formed the Tasmanian Division of the Wireless Institute of Australia. This group, known as the Launceston Radio Club, thought it so important to have a close knit association of Amateur Radio Operators that they were prepared to disband their local club to become a part of a National Organisation.

It must be remembered that this was in the era when the neighbours crowded into the living room to hear an interstate BC, to log overseas DX made headlines in the national dailies, and the fact that young John built a Xtal set in a matchbox was good conversation at morning tea. The era of public appreciation! But our young men of those days had that foresight to realise the day would come when the General Public would not give a hoot when amateurs bounce signals off the moon, or that two-way ATV contacts were made across Bass Strait, or that an Amateur Radio Satellite was passing overhead daily or that it became common place to converse world wide not only by means of morse code but by RTTY, SSTV, and just plain voice.

It is true that some of those young men of yesterday are now silent keys, some of them are hale and hearty and are "with it", others are sometimes bewildered by the progress in the state of the art but it must not be forgotten that the young men who were radio amateurs in the twenties, who built TPTG Transmitter and receivers were then up with the latest and probably did more experimenting and construction than is done today just to find out why. These were the days before the books were written and in lots of cases before the parts were manufactured.

However, we salute the youth of today with its exuberance and speed at which they get things done, but on the other hand remind them that this is the era of NON-Public appreciation and NOW more than it was 50 years ago, it is important to belong and work for our National Organisation — The Wireless Institute of Australia!

Ted Cruise VK7EJ
President and Federal Councillor
W.I.A. Tasmanian Division

At the Federal Convention held in Melbourne at Easter, the following plan for two metre FM channels for simplex and repeater net operation in Australia was passed for immediate implementation, subject to PMG approval:

1973 FREQUENCY ALLOCATION PLAN

Repeater Channels	Input Frequency (MHz)	Channel No.	Output Frequency (MHz)	Channel No.
1	146.10	42	145.60	32
2	146.20	44	145.70	34
3	146.30	46	145.80	36
4	146.40	48	147.00	38
5	146.50	50	147.10	62
6	146.60	52	147.20	64
7	146.05	41	145.55	31
8	146.15	43	145.65	33
9	146.25	45	145.75	35
10	146.35	47	146.95	59
11	146.45	49	147.05	61
12	146.55	51	147.15	63

SIMPLEX CHANNELS — National FM Primary Simplex: 146.00 MHz (previously channel B now Channel 40).RTTY Net: 146.75 MHz (55)
National ATV Liasion Net 146.85 MHz (57)
SECONDARY FM SIMPLEX CHANNELS: 145.85 (37), 146.65 (53), 146.70 (54), 146.80 (56), 146.85 (57), MHz

Policy was laid down that the eventual intention is for all repeater channels to be above 146 MHz, i.e. Repeater Channels 4,5,6,10,12.

All channels will be available for allocation by State Repeater Committees as required. A channel numbering system on a numerical basis starting at 144.00 MHz as Channel "0" and subsequent channels in 50 KHz steps was adopted. Initially, this system will be applied only above channel 30 (145.5 MHz). All present two metre net frequencies will be rounded off to the nearest 50 KHz.

Fractured Bones and Little Yabbies on a Lighthouse

M. L. Jenner* VK7FB/T

What makes one become a lightkeeper? What is a lightstation like? What are the living and working conditions? What do you do to pass the time? These, and similiar questions are asked of us by tourists and amateurs alike.

The first question is a little hard to answer, and for Anne and myself, the last is easy. For those of you fortunate enough NOT to have worked us, and been "ear bashed" as only Fractured Bones knows how, I will attempt to paint a picture of what we have come to know as true civilisation!

Why

What makes one become a lightkeeper? Well, for a start, like many other professions, one does not have to be mad, but it is a big help! At the time I joined the Department of Shipping and Transport, both Anne and I had good jobs, and we lived right at the radio station I worked at. We each had a car, we were both on shift work so had plenty of day-light time at home and we had a console of home brew gear six feet high and five feet wide and an antenna farm to match.

Why give all this up? At heart I am a bit of a romantic or dreamer, and the idea of living in remote places had a great deal of appeal. It most certainly was not for the money. In fact my wages went down and expenses went up. I think most people have at some time during their lives, had a dream of living on an island, but few take the plunge and do it. We decided that as we were young it would do us no great harm to give it a try, and we did just that.

With a great deal of heartache the console was dismantled, all the VHF gear disposed of, the furniture and the cars sold, and what was left over was packed into tea-chests ready for transport. Due to power limitations on lightstations, the home-brew gear was out of the question so we procured an FT50, which consumes about 120 watts and which turned out to be ideal.

By the time we had set foot on the ship we had spent and lost a lot of money. The cars and furniture were sold at a loss, and in addition there was the expense of an inverter, DC motor for the washing machine and of course, the rig. So the material and financial cost for us was high, which brings us back to the question, what makes one become a lightkeeper? I'm blowed if I know, but I am not sorry I did!

The QTH

What is a lightstation like? I can only speak for the Tasmanian lights, but I think they must be much the same the world over. The one thing they all have in common is that they are all by the sea side! Visitors seem to have the idea that the weather must always be wild, the seas always rough and the life always hard. None of these is true. The weather is not much different to any seaside resort. Some stations do suffer from the weather a little more than the average weekend shack-owner would put up with. Maatsuyker Island for instance is located nearly ten miles south of the Tasmanian mainland and is in the path of the 'Roaring Forties', with little to shelter it from the full force; there is always a fair swell running, and there is only one spot on the island where a landing can be made safely. At the other extreme, Eddystone Point, on the north eastern tip of Tassy, has miles of beautiful white beaches stretching away north and south. There is rarely a big swell, and in fact for days on end the sea will be like a mill-pond. As the weather pattern in Tasmania is predominantly westerly, the climate is quite mild and many people would give their eye teeth for a shack in this area.

The remote stations are all equipped with HF radio, Eddystone Point acting as the base for Swan Island, and Cape Bruny the base for Tasman and Maatsuyker Islands and several skeds a day are made for passing weather reports for relay by telegram to the Weather Bureau. The equipment varies from 1940 vintage Hallicrafters and Bendix AM rigs through AWA 60A tranceivers, to the latest Racal SSB gear, and all rigs are capable of operation on 6204 in case of emergency. In addition, the Tasman Is. — Cape Bruny-Maatsuyker Is. link has a tone operated selective calling system installed.

Power Supplies

Power on the DC stations is produced by single cylinder diesels driving 2.2 KV generators and an 85 cell bank of alkaline batteries. The kero lights have only one generator, and the others, two. Battery power is used during the day when the load is generally light, and the generators are used direct to line while the light is operating. The batteries are charged whenever necessary, the line still being connected during these periods, so that the DC voltage can vary from around 100 volts just prior to light-up, up to 140 or so towards the end of the charging period. Each lightkeeper has his own rotary inverter to convert to 240 AC but the system has quite a few limitations. Inverters are available in two basic models, 250 and 500 watt, and a 500 watt unit drags about 6 amps or so from the DC supply. Depending on the type of equipment used in the main light, the drain of this varies from 6 to 10 amps and the supply is capable of 22 amps, so one has to be a little careful with the number of lights in the quarters when the inverters are in use. Voltage drop is also a problem with variations in load, and it is desirable to have some form of voltage control on the inverter, although few have. We have a home-brew device, installed as part of the "shack" in the corner of the kitchen, and the inverter is located in the pantry to keep the noise down a little. Ours is a 250 watt unit and I have a distribution system so that a check can be kept on the load.

Cooking and hot water is handled by a slow-combustion stove, and we have kerosene refrigerators and these, together with basic items of furniture, are supplied by the Department.

Some Limitations

What are the living and working conditions? Not too bad on both counts. Life is very much harder for the XYLs than for the OMs I feel. Due to the limitations on the power supply, electric fry-pans, steam and dry irons and vacuum cleaners are out. The inverter will just run the polisher but it is a bit tough on it, so we use it direct on the 110 DC. It runs at only half speed of course, but is still easier than the "armstrong" method! One has to be careful not to overload the trusty inverter, so combinations are worked out. The TV and rig together, TV and electric blanket or rig and blanket, etc. When the sewing machine is required, the rig goes off! We have become used to these things by now, and find it hard to get used to living while on leave. It feels peculiar going to bed without first stoking up and closing down the combustion stove, turning off the inverter, and checking the light. I regularly get caught with the water pressure too! Our pressure is quite low and is provided by a gravity tank which is filled from the main 10,000 gallon tank with the aid of a DC pump (which by the way, cannot be turned on while the generator is running, as it trips the breaker, and means a walk for someone up to the engine room, with alarm bells ringing and big panic all round! Too bad if one forgets to pump-up during the day!) Having been used to turning the tap on flat out, and waiting some time for a cup to fill, you should see the results when I do the same on city water mains! The cup is blasted into the sink and an extensive mop-up operation is required!

No Artificialities

It is a strange feeling too, to come back to so called civilisation after an extended period on an island. Although Anne had been ashore several times during our nine month stay on Tasman, I had not been into a shop, seen crowds of people, or for that matter, cars and what have you for that period. It was a harassing experience to cross the main road to buy some lunch from a shop in St. Helens during our move by boat from the island to Eddystone Point. Even from this station, the towns take some getting used to. If any cars come out here, they must stop, or meet a watery end, and mostly they are coming to visit us. In the town it is hard not to get up and go to the door when ever a car passes!

For those who are used to going to the footy on Saturday, or playing golf, or bending the elbow in the local, this is not the life. For Anne and myself it meant no great changes though. Neither of us were gad-abouts and although Anne missed being able to go shopping, and was not at all keen on giving up her position as Audio Continuity

*Eddystone Point Lightstation, via Gladstone, Tas. 7254.

operator with ABC TV, and I missed the radio meetings and the weekends off and so on, we both soon got used to the life, and neither of us can face the thought of going back to a city or town to live and work.

Communications

Perhaps the hardest thing to contend with, particularly at first, is the mail service. The islands have a fortnightly service, Tasman and Maatsuyker by fishing boat and Swan Island by light aircraft. Cape Bruny and Eddystone Point have a weekly service run in turn by the lightkeepers, to the nearest town, which in our case is twenty five miles away on a not so good road, and has a population of around 180! Try ordering food today which will not arrive for a fortnight and has to do you for the following fortnight! As the outgoing mail has already left before it is possible to read the incoming lot, it can take six or eight weeks to conduct any business in this way. The only other means of communication on the islands is per the radio, and this means dealing through a third person which is not always convenient or desirable. The stations lucky enough to have the telephone connected are invariably miles from anywhere and the very person you wish to ring is on the most expensive rate!

On the credit side though, there are many many advantages. Some are psychological and a little hard to put into words. The long wait between mail days which at times can be so annoying also has the effect of slowing down the whole tempo of living. One comes to live from fortnight to fortnight rather than from day to day and one day you suddenly realise that the pressure is off and life is much more civilised. Some advantages are very tangible. Where else can you work by the seaside with good swimming and fishing on the door step? As much crayfish as you care to eat. No pollution of any kind. No traffic noises or peak hour jams, no maddening crowds of people, no rush and bustle, and nothing stopping you from popping home at any time for a cuppa. Family life is much closer and the whole atmosphere is far more relaxed than one generally finds in more normal walks of life.

Chores

As far as the job is concerned, perhaps the most complicated and interesting task is that of compiling weather reports. This is done at three hourly intervals, the only real draw-back being the 0300 report, which on a two-man station entails crawling out of bed at that revolting hour for a ten minute job. Quite often it is necessary to rug up in winter woollies and wet weather gear just for a 100 yard dash and five minutes pushing a pen. But to me even this has its romantic side.

Our main job obviously is to keep the light in good repair, and alight! Cleaning the lens and prisms is a four or five hour effort for two of us, and in bad weather this has to be done fairly regularly. We have several acres of lawn to keep and we do almost all the painting on the station, inside and out, quarters and tower. Stopping the rust is just about a full time occupation in itself on external steel work. The business of living in these areas creates a good deal of work too. Wood to be split and carted, refrigerators to fill with kerosene, water to pump up and rubbish to collect and dispose of. The garbage service out here is lousy! And so it goes on. We are never in a position to say that there is nothing to do!

Wild Life Studies

Passing the time is easy. In addition to amateur radio one has the opportunity to do many things unheard of in the cities. We have acres of unspoiled and unpopulated bushland in which to roam, and study the wild life, and hunt wallaby both for pet food and our own consumption. We have a two or three mile long beach to the south of the point, which is virtually all ours, because, although there are a few holiday homes out here, practically no-one uses the beach, and here we can romp about and sunbake in the all-together quite freely if we so desire. We are both interested in the native flora and fauna and have collected many specimens for the Tasmanian Museum. We regularly see Tasmanian Devils, wombats, native cats, tiger cats and the beautiful Forester kangaroo. We have possum living in the roof, and have had several pet wallaby. Two cats, a budgie, a pair of boxers and several coloured mice complete the menagerie of pets at the moment. Anne has all the normal duties of the housewife, and little spare time to worry about. She spends some time in reading and sewing, and manages to get on the air from time to time also. For outside recreation I have an old motor bike and also spend some time out fishing with a commercial fisherman who lives quite close to the station.

Quite a lot of our spare time has been taken care of recently with the generation of a harmonic, Peter, and now with him and the way we live and work, our lives are about as full and happy as one could wish for.

The Rig

On the amateur radio front, the gear consists of a Yaesu FT50 transceiver with the addition of several of my own gadgets attached to it, and is set up in semi-console fashion on a spare table in the kitchen. Antennas consist of a rather poor inverted "V" multidipole for 40, 20, 15 and 10, a half wave on 80 inverted "V" with tuned feeders through a "Z match" coupler (which I mostly use on all bands), and the hairiest "quad" imaginable for 20. I have operated from Tasman and Swan Islands and from here at Eddystone. All appear to be super locations. There is no man-made noise at all. As a reference, the audio gain control is calibrated 0 to 10, and an S3 signal can be heard all over the house on position 1. On all bands the gain can be run flat out without causing the speaker cone any discomfort at all! For 45 watts PEP output and poor antennas, I get consistantly good reports from all over the world. If I can hear 'em I can work 'em even if the S meter is not lifting off the stop! And no local QRM. The nearest amateur to the west and south would be seventy miles or so airline, and to the east all our neighbours are ZLs!

At the time of writing we are in the process of gearing up for SSTV. This has proved to be a rather frustating activity due to the long mail delays and the impossibility of shopping personally for gear, but we are slowly getting there. There are a great number of problems in setting up a reasonable station. The power supply limitations necessitate relatively QRP rigs. It would be possible to run higher power but the expense of providing an alternative source of mains does not warrant it. Antennas are a problem. There is any amount of space for them but once again, to build a decent high gain array for HF that would stand up to the weather conditions, and could be easily dismantled for transport, is a little beyond my pocket.

One cannot collect too much of anything either, including Amateur gear. When a move comes up, and this is a fairly regular occurence, everything must be packed right down to the last item, and in such a way that it will stand the rigours of much handling by gentlemen who have little heart when it comes to transporting radio equipment. It is likely to be moved from one's home by truck, to a fishing port, loaded onto a small boat, rolled about at sea for some time, off-loaded into a dinghy, hoisted out by flying-fox, lifted up a cliff face on a haulageway trolley and carted on a trailer over a rough old track before eventually coming to rest again! Enough to give anyone the horrors!

VK7FB and VK7LY can be heard regularly on 7050 and on Sunday mornings on 7110, and on odd occasions put in an appearance on 80 in the evenings. Operation on the other bands is spasmotic at the moment, but our operating routines will probably change somewhat when the SSTV is a going concern, or if we move again.

AR

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Why Not Try Double-Sideband?

T. MITCHELL,* VK3EZ

Double-sideband means, in amateur usage, removal of the almost-useless carrier from an AM transmitter signal by using the PA as a balanced modulator. This article describes how to do just that.

I could not open this article better than by quoting from Chapter 10 of the Third Edition of the R.S.G.B. publication "The Amateur Radio Handbook". To quote: "This chapter would be incomplete without a brief reference to the double sideband system of communication which is simpler, cheaper and more efficient than conventional A.M. A low-power modulator of the type customarily used for grid modulation is big enough to drive any of the popular tetrodes to a peak d.s.b. output greater than the same valves are capable of producing in anode modulated service. As d.s.b. is usually generated in the stage immediately preceding the aerial, the problem of linear amplification is avoided, and band changing is as simple as in a C.W. transmitter. There is no resting carrier, so voice control may be used as with s.s.b. Its disadvantages are that it occupies ...ce the bandwidth of s.s.b. and cannot be received without special equipment." (I will deal with the last few words of that quotation later.)

The expression "Double-sideband" in describing this system is not really correct. It should be called "double sideband suppressed carrier". However, it is commonly referred to as "DSB".

DSB has many of the advantages of SSB. However, it is clearly not as efficient as SSB because power is wasted in the unwanted, but transmitted, sideband.

If you, as an Amateur, want to communicate with SSB operators, yet have not the time to build an SSB rig, or for whom the cost of "going sideband" is prohibitive, then I suggest you seriously consider "going dsb". You probably have enough components in your junk box. You will need no filter crystals, heterodyne converters, or linear amplifier. If your rig works as well as mine you will work ssb stations who in most cases will be unaware that you are transmitting dsb.

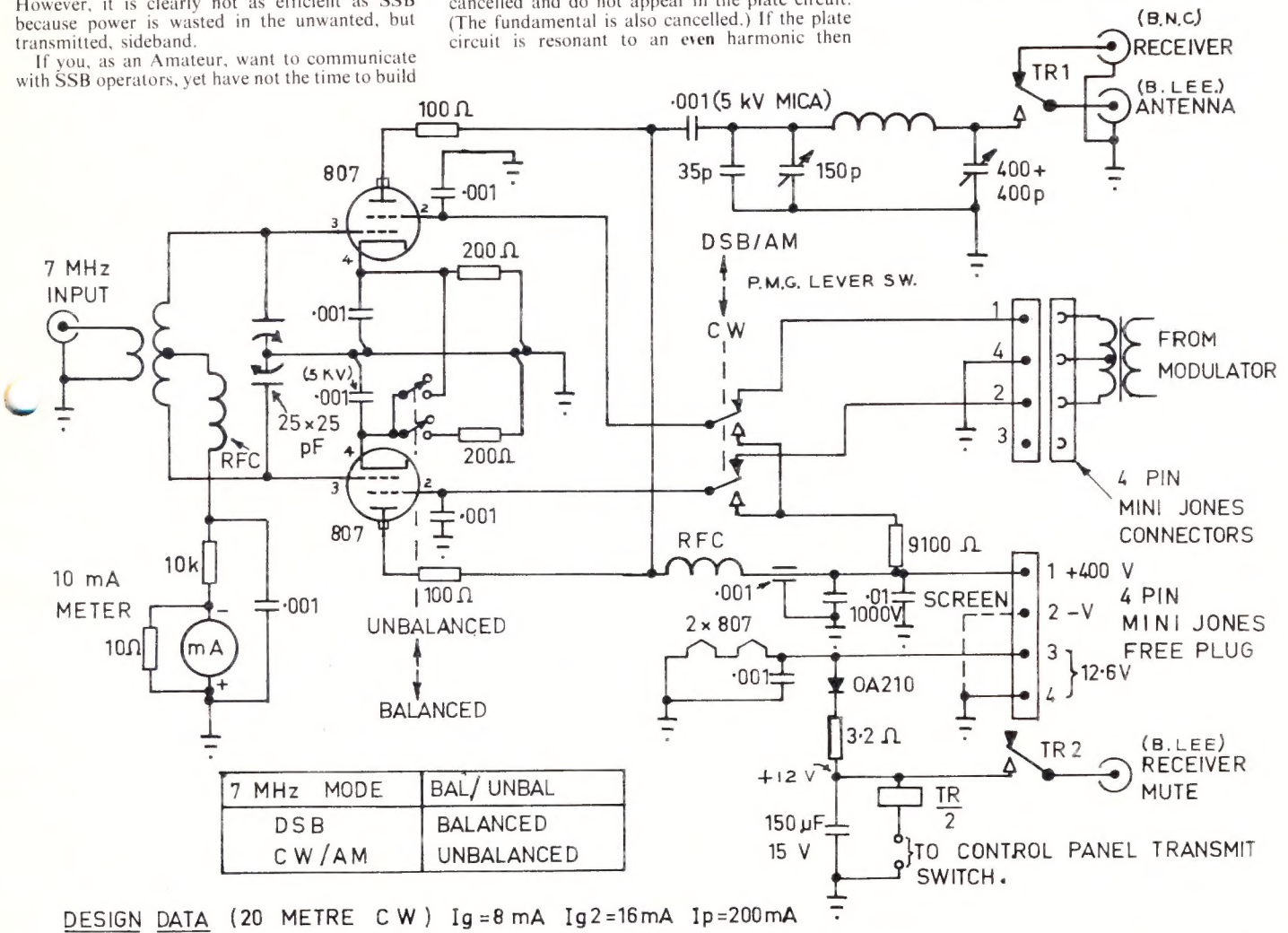
The principle of transmitting dsb is quite simple. Referring to the circuit diagram, the power amplifier tubes (2 x 807) act as a high level balanced modulator. Radio frequency energy is fed to the grids in push-pull and because the plates are connected in parallel the phase relationships are such that the symmetrical radio frequency signal is not present in the plate output circuit. Hence the expression "suppressed carrier". However, audio frequency energy applied to the screen grids in push-pull will "unbalance" the valves and the two sidebands (RF plus Audio and RF minus Audio) will appear in the plate circuit. Hence the expression "Double Sideband Suppressed Carrier". In the absence of modulation no signal is present in the output tank circuit.

I would like at this point to explain how I came to build this particular 7 MHz dsb transmitter. A few years ago I wanted to go on 14 MHz C.W. I built a "Push-push doubler" which is a circuit with the grids in push-pull and the plates in parallel. In a push-push RF multiplier the odd harmonics, due to phase relationships, are cancelled and do not appear in the plate circuit. (The fundamental is also cancelled.) If the plate circuit is resonant to an **even** harmonic then energy at that even harmonic will be present in the plate circuit. I will be pleased to send a photocopy of my original push-push doubler if anyone is interested. After many DX contacts on 14 MHz C.W. a few amateurs (including VK3VH and VK3BCX) appeared on 7 MHz dsb. It occurred to me that my push-push doubler could quite easily be converted to a 7 MHz dsb transmitter by replacing the 14 MHz plate resonant circuit with a 7 MHz resonant circuit and applying modulation to the 807 screens. By keeping the physical layout of grid tuned circuit components fairly symmetrical, absolutely no carrier could be detected in the plate circuit. (This can be checked by applying DC to the screens.) No balancing control was necessary. An alternative to the splitstator capacitor and inductor arrangement is a phase-splitting circuit in the RF driver stage.

Any audio amplifier capable of supplying two watts or so will be suitable as a modulator. I use a 6SN7 in cascade driving a 6V6. My modulation transformer is a small 50 Hz power transformer 240:240-0-240V. It is important to have an effective gain control because excessive modulation produces an over-wide transmitted bandwidth.

You will note from the circuit diagram that by open-circuiting one cathode the system becomes unbalanced. Even if you do not intend to work C.W. or A.M. the facility is useful for plate tuning purposes particularly if you have no audio tone available.

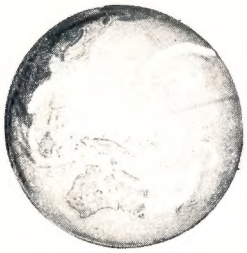
(Continued on page 19)



7 MHz MODE	BAL/ UNBAL
DSB	BALANCED
C W / AM	UNBALANCED

DESIGN DATA (20 METRE C W) Ig = 8 mA Ig2 = 16 mA Ip = 200 mA

DOUBLE SIDEBAND SUPPRESSED CARRIER (60 WATT PEP) AND CW/AM TRANSMITTER - 7 MHz



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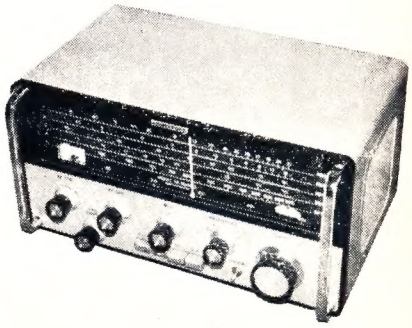

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Dear Sir,

26 MAR 1973

Careful consideration has been given to your proposals for the introduction of four types of amateur radio licences but I cannot agree to the adoption of a licensing structure of this nature because of the additional administrative work which would be involved.

I am prepared to recommend the introduction of Novice licences, however, the examination for which would include the subjects of "Regulations" (at the normal standard), an elementary Theory paper and a Telegraphy test at 5 words a minute.

The conditions which would apply to the operation of an amateur station authorised under a Novice licence would be as follows :

(a) the transmitting equipment to be crystal controlled;

(b) operation to be confined to within the bands

3.525-3.575 MHz)
21.125-21.200 MHz)
26.960-27.23 MHz)

(c) types of emission A1, A3, A3A, A3B, A3H, A3J, F3 (± 3 kHz)

(d) power not to exceed 10 watts Pm except in the case of A3A or A3J emissions when it shall not exceed 30 Pp.

Novice Amateur Operators' Certificates of Proficiency would not be issued, Novice licences being granted to applicants who gain a pass in the examination.

Furthermore, it is agreed that Novice licences will be issued on a two year tenure only and the whole question will be reviewed after a five year trial period.

I would be pleased to receive your views on the above-mentioned proposals as soon as practicable please. You will appreciate that before Novice licences can be introduced it will be necessary to amend the Wireless Telegraphy Regulations which may take some time and will require the approval of the Minister.

Mr. P.B. Dodd,
Manager,
Wireless Institute of Australia,
P.O. Box 150,
TOORAK. Vic., 3142

Yours faithfully,

(H. S. Young)
Controller, Regulatory
and Licensing Section,
Radio Branch.

SEEN THE LIGHT

COL. HARVEY,* VK1AU

Essential reading for those who do not intend to depart this life with their boots on. Is your equipment really off? Wise men exist in Bible stories. They were also to be found among pioneer wireless experts; and much less frequently among electronic equipment production engineers.

It was one of the old wireless mens' wise teachings which probably saved me from electrocution recently, and could do the same for you. Nowadays, it is the in-thing to "Switch to Safety", whatever that incomprehensible American jargon is supposed to mean. In the olden days, those who knew what they were about simply pulled the mains plug out. Knowing now what we do about the Theory of Probability of failure, the oldies had the right idea.

Imagine now, if you will, a very common practice, intended to keep RF off the mains and/or hash out of equipment. Fig. 1A will refresh your memory. The practical version would usually follow Fig. 1B.

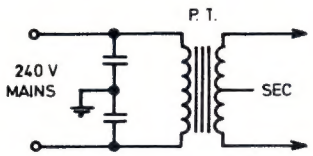


FIG 1A
TYPICAL CIRCUIT

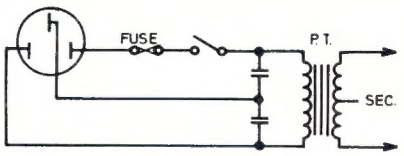


FIG 1B
TYPICAL PRACTICAL INTERPRETATION
(OLD FASHIONED)

Since thousands of power transformers are wired like this, it must be OK, you say?

Let's think it over. While we are at it, let's consider why another wise man advocates the use of a warning lamp across the transformer primary.

Take capacitor failure first. If the active to earth capacitor fails, either the fuse blows, or you have a small fire and no HT. If it is the other capacitor that fails, nothing happens, you say? OH YEAH?

Have a look at Fig. 2, redrawn to show the situation if the incoming mains leads are reversed so that the switch and fuse are now in the neutral line!!!

Note that because neutral and earth are virtually the same thing, failure of the capacitor WILL ENERGISE THE TRANSFORMER! This is bad enough if the secondary happens to be a low voltage one, but imagine the effect on honourable ham working on the linear tank circuit, "switched to safety" and all, when the capacitor decides to fail.

*16 Leane St., Hughes, ACT, 2605.

Left hand in pants pocket won't help much in this case, assuming that you work that way.

Modern terminology would opt for redundant failsafe switching, but the wise old men would settle for a completely fail-safe method called "pulling the plug out". Even then they would approach a possibly dangerous component with a delicately poised shorting crowbar. Slightly less wise men would possibly tie a string around their finger to remind them to pull the plug out.

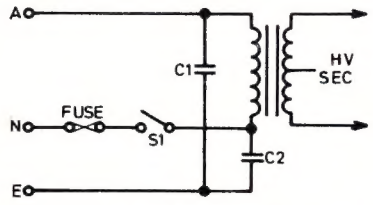


FIG 2A

With S1 open, failure of C2 will energise the transformer, with a gross safety hazard. The equipment is also effectively unfused. Even if correctly connected to the Mains, the fuse is alive at all times.

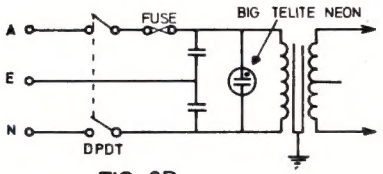


FIG 2B
RECOMMENDED PRACTICE

Nowadays, with nice bright amber or red fluorescent TELITE 240V Neons available for about the same price as a ball of string, the word is to put a Neon lamp across every potentially lethal transformer primary. If the thing glows, keep sticky fingers well away from rectifiers, filters, tanks, etc.

Far from theorising or pontificating on the subject, it has to eventually happen to you, before the message comes across loud and clear. Fortunately in my case I didn't have to receive the full treatment. One such Neon (reluctantly installed) glowing unexpectedly on a SWITCHED OFF (i.e. to safety!!) 1800 volt supply alerted me just in time to stop delving into a blacked out and supposedly dead linear. Yes, I **had** worked on the linear before with the mains switch OFF, and with this accident just waiting the "chance of failure" number to come up!!

A double pole mains switch would drastically reduce the chance of accident BUT NOT REMOVE IT. (Switches are and can fail). In fact, this supply was supposed to be switched and fused in the active lead, and the risk of switch failure due to inductive arcing was reduced by paralleling two switch sections. To be honest, the risk of energising the primary in the way described had not been considered. But for the timely glow from the NEON, fortunately while both hands were out of the linear, the trap would have been well and truly sprung when a newly installed 630 volt mains TVI by-pass capacitor failed.

As the wise old man used to say "Don't switch it off Lad. Pull the so and so plug out". Which is exactly what I am going to start doing again, before I get inside any chassis with more than 12 volts on it.

Strange, isn't it, how one's continued presence in Hamland can depend on the reliability or otherwise of a 20 cent capacitor. Since I dislike reading in Silent Keys the names of fellows I have had pleasant QSOs with, how about getting out the multimeter now, and checking your mains plugs and equipment for switching and fusing in the active lead. I **thought** mine were right. You could be in the same boat, and not as lucky. While you are at it, how about making sure that your earth leads can carry a 10 amp fault current?

Meanwhile, three cheers from Canberra for a wise old ham; for Mr. TELITE and his merry men; and for all those who promise to pull their plugs out.

FRONT VIEW OF SOCKET
REAR VIEW OF PLUG
(S.A.A. STANDARD)

Hints & Kinks

Modern circuit materials and components demand different types of tools from those normally available in the hardware shops. Dentists use probes which are extremely useful for removing components from PCB's and the "Spencer Wells" locking forceps used liberally in operating theatres and surgeries acts like a third hand. To solder a bunch of two or more wires together keep a long helix of tinned copper wire handy (26 or 28 swg is best) i.d. of helix should be about 0.125, and this will hold solder blob around up to six component leads. VK3ASC.

COMMUNICATIONS

"As amateurs we experiment in the art of communication a yet, being honest with ourselves, we do not seem to communicate with each other very well." Extract from Editorial in CQ.TV Feb '73.

DX CERTIFICATES

Jim Fisk W1DTY, has some sound comments to offer on DX certificates in his editorial for Ham Radio of March '73. He comments about the multitude of facets to amateur radio and picks out DX-chasing and wallpaper collecting as near the top of popularity. On DX certificates he comments that many are beautifully drawn up and a credit to the collection but that some, unfortunately, are not worth the paper on which they are printed and goes on to list three requirements for a good certificate.

HELPING HANDS

"As I have said before, the people who scream loudest are those who help least." Except from Editorial in Tuned Lines April '73. And so it is the world over and ever was so. BUT: Are all the loudest screamers, one might ask, members of the Institute?

CUSTOM IMPORT DUTIES

A recent letter from the Chief By-Law officer of the Department of Customs and Excise advises that equipment specifically for use by licensed Radio Amateur operators is currently the subject of Departmental enquiries in relation to by-law admission. The whole question is being actively pursued.

SATELLITE LANGUAGE

"Ascending nodes" — result of eating large quantities of radishes; also known as erp.

SSTV Sync Generator for Australian Standards

ALLAN B. MASON,* VK2GR/T

This generator provides stable line and frame sync pulses which are locked to the 50 Hz mains. It uses integrated digital divider circuits.

CIRCUIT OPERATION

IC1 is a monostable multivibrator which squares up to 50 Hz sine wave and provides positive output pulses to drive the divider chain.

IC2 is a dual JK flip flop connected in a divide by three configuations. Tis gives an output frequency of 16.66 Hz which is the line frequency.

IC3 is the line pulse monostable multi to provide the 5ms line pulse which is set with VR1.

Q1 inverts the positive line pulse to give the negative line drive output.

IC4 and IC5 which are a Decade Counter and a Divide by 12 Counter respectively, are connected in cascade to give a 120 division ratio from the 16.66 Hz line frequency. The output of this is a 7.2 Second period (the Frame Period).

IC6 is the frame pulse monostable multi and provides the 30ms frame sync pulse which is set with VR2.

Q2 inverts the positive pulse to provide the negative frame drive output pulses.

The two drives are mixed with the diode gate D2 and D3 and inverted in Q3, the sync drive amp, to provide Mixed Sync which is used directly to modulate the subcarrier oscillator in the SSTV modulator.

CONSTRUCTION

Any silicon NPN transistor can be used for Q1, Q2 and Q3, and any silicon diode should work for D1, D2 and D3 as the pulse rate is low and the rise times not really important at these frequencies.

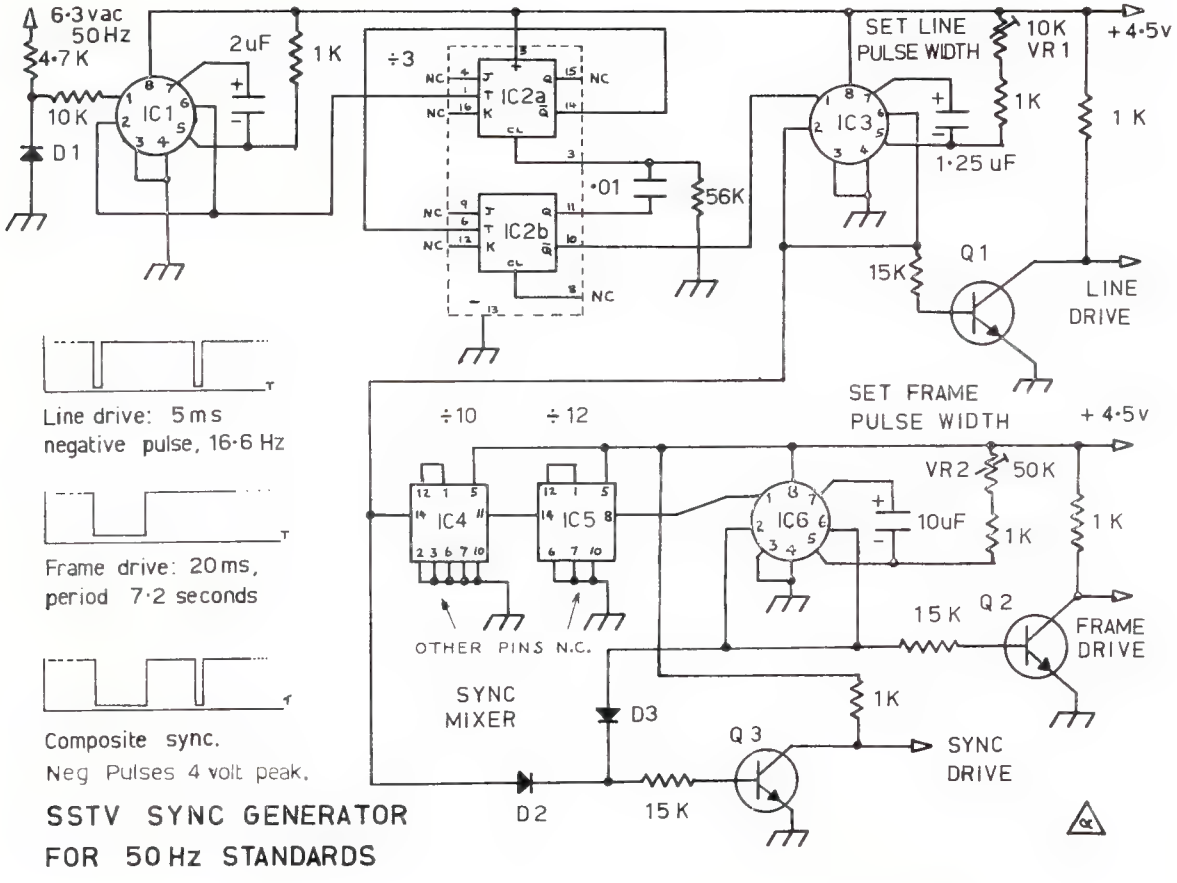
Any two JK flip flops (RTL or TTL) can be used for the IC2 divider.

One big advantage with using a sync generator is that only one subcarrier oscillator is necessary for several sources of slow scan video, if all sources are locked to the generator.

Negative output pulses were chosen to keep with the standard used on my other ATV equipment. I also use the 50 Hz frame drive from the fast scan TV sync generator (which is locked to a 1 MHz crystal) to drive the SSTV sync generator, instead of the 6.3 volts 50 Hz, as the vidicon camera is locked to the fast scan generator.

As the price of IC's has come down quite low in Australia a project like this can be built for very little outlay and this is offset by its usefulness. Ref: Sync generator for SSTV. Ham Radio June 1972. Page 50.

* 18 Queens Rd., Asquith, N.S.W. 2078.



IC1, IC3, IC6: µL914
IC2: SN7476
IC4: SN7490
IC5: SN7492
Q1-3: 2N706 (see text)
D1-3: IN914

FIXED CAPACITORS

C. A. Cullinan* VK3AXU

Are you confused by the vast range of types of capacitors in the catalogues, and which is best for what application? You should find most of your questions answered in this comprehensive series of articles on capacitors, and also benefit from the various practical examples provided from the author's long experience.

Much of the material in this series of articles has been extracted from publications of various Companies and "Amateur Radio" expresses its gratitude to the organisations concerned, without whose co-operation the article may not have been possible.

DEFINITIONS

"Capacitance.

"Electrical. 1. The ratio of an impressed charge on a conductor to the corresponding change in potential. 2. The ratio of the charge on either conductor to the potential difference between the conductors. 3. The property of being able to collect a charge of electricity.

"Capacity. Electrical. Same meaning as Capacitance.

"Capacitor. Electrical. A device for accumulating and storing a charge of electricity, consisting of two equally charged conducting surfaces, having opposite signs and separated by a dielectric.

"Condenser Electrical. Same meaning as Capacitor."
Extract from Random House Dictionary of the English Language.

"1. Capacitance is one of the three electrical quantities present in all radio circuits. The radio man endeavours to concentrate capacitance in definite well-known forms at definite points in the circuits, but capacitance exists between different conductors in the circuits and between the various conductors and the ground. Such capacitances, usually small, are ordinarily of no importance in the case of low or audio-frequency currents but may be of great importance in radio-frequency circuits particularly at VHF and UHF.

"A capacitor is an electrical device in which capacitance plays the main role. While some inductance and resistance may be present, these quantities are usually of such minor importance that they are negligible.

"A capacitor has three essential parts, two of which are usually metal plates separated or insulated by the third part called the *dielectric*.

"The amount of electricity which the capacitor will hold depends on the voltage applied to the capacitor. This may be expressed as $Q = C \times V$. The capacitance of the capacitor is the ratio of the quantity of electricity and the potential difference or voltage, ed as $Q = C \times V$. The capacitance of the farads and V in volts. The capacitance of a capacitor is dependent on the size and spacing of the plates and the kind of dielectric between the plates.

*6 Adrian St., Colac. 3250.

"2. Units of Capacitance. The unit of capacitance is the *farad*. A capacitor has a capacitance of one farad when one coulomb of electricity can be added to it by an applied voltage of one volt. This unit is too large for practical use so that a smaller unit, the microfarad, abbreviated *uf* or one-millionth of a farad, is used. Another unit, the micro-microfarad is used as well. It is abbreviated *uuf*. The micro-micro-farad is known also as the picofarad, abbreviated pf or pF.

"Yet another unit occasionally used is the Jar. One farad = 9×10^9 jars.

"Still another unit is the *centimetre* or absolute unit. One farad = 9×10^{11} centimetres.

"3. Electrical Energy of a Charged Capacitor. Work is done in charging a capacitor because the dielectric opposes the setting up of the electric strain or displacement of the electric field in the dielectric. The energy of the charging source is stored up as electrostatic energy in the dielectric.

"The work done in placing a charge in a capacitor is

$$W = \tfrac{1}{2}Q \times V = \tfrac{1}{2}CV^2 = \frac{Q^2}{2C}$$

where W is expressed in joules,
Q is expressed in coulombs
V is expressed in volts.

"The work done in charging a capacitor is independent of the time taken to charge it.

"4. Power required to charge a Capacitor. The average power required to charge a capacitor is given by the equation

$$P = \tfrac{1}{2}\frac{CV^2}{t}$$

where P is expressed in watts,
C is expressed in microfarads,
V is expressed in volts,
t is expressed in seconds.

"If the capacitor is charged and discharged N times per second the above equation becomes

$$P = \tfrac{1}{2}CV^2N$$

"If an alternating e.m.f. of frequency f is used in charging a capacitor, the equation may be written

$$P = CEo^2f$$

where P is expressed in watts,
C is capacitance in farads,
Eo is the maximum value of voltage,
f is the frequency in cycles per second."
(The above was extracted from a paper by E. L. Hall, E.E. US. Bureau of Standards.

"No other electrical component is called upon to perform such a wide variety of functions in electronic circuits as the capacitor. Most of these applications are based upon the ability of the capacitor to differentiate between electrical currents of various frequencies. Such applications include; d.c. blocking, ripple filtering, r.f. and audio by-passing, coupling, frequency determination, R-C timing, and energy storage. Because of the varied requirements of these uses, fixed capacitors are made in many types and sizes, each especially engineered to fulfill a specific application or function. An important part of modern circuit design is therefore the choice of the proper capacitor for the circuit application at hand. In many cases, the success or failure of the design will actually depend upon this choice. The radio engineer, experimenter, and amateur must therefore have a firm background in capacitor design and application. This article will review this material and point out certain important 'kinks' in the use of fixed capacitors.

"Probably the most direct route to a mastery of the 'safe and sane' use of capacitors is to establish a thorough understanding of the characteristics and limitations of each general type. The choice of the proper type for each circuit application then becomes merely a matter of following good engineering practice. For this reason, we will commence with a discussion of the basic types of fixed capacitors which are encountered in electronic circuitry.

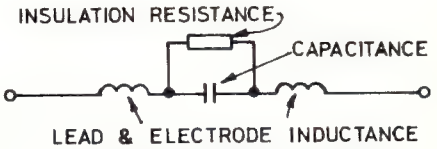


FIG 1 CAPACITOR EQUIVALENT CIRCUIT

"Since a capacitor is fundamentally two metallic conducting sheets isolated by a suitable dielectric material, the basic types are classified according to the type of dielectric used. They include:

Air Dielectric Capacitors
Mica Capacitors
Ceramic Capacitors
Tubular Capacitors
Electrolytic Capacitors

"Just as all inductances have distributed capacity and resistance, and everyday resistors have some inductance and 'end-to-end' capacitance, practical condensers are not perfect capacitances. All have a certain amount of residual inductance associated with the leads and plates, and also a finite value of resistance called the 'insulation resistance'. Thus, the equivalent circuit of any capacitor can be considered as in Fig. 1. The magnitudes of these unwanted characteristics vary through wide limits as a function of mechanical design and type of insulation or 'impregnant' used, and must be considered along with such other characteristics as capacitance value, voltage and current ratings, temperature coefficient, stability, etc., in selecting a capacitor for a particular job. The actual choice is usually a compromise between mechanical and electrical perfection on one hand, and the dictates of economy, space, and the practical requirements of the application on the other.

The Air Dielectric Capacitor

"From the standpoint of low losses (high capacitor) and constancy of capacity value, the most nearly ideal capacitors are built with air (or vacuum) as the dielectric between the plates. Such capacitors are not perfect, however, for although air is a perfect dielectric having zero power factor, some losses arise due to dielectric hysteresis in the insulating material used to support the plates. Charging currents flowing in the leads and plates cause additional power losses and give rise to some residual reactance.

"The air-dielectric capacitor occupies much more volume for a given capacitance and is usually more expensive than any of the other general types. The reasons for this are apparent from an inspection of one of the simpler empirical formulas for the capacitance between parallel plates whose dimensions are large compared with the spacing between them, so that 'fringing' may be neglected:

$$\text{CAPACITANCE } (\mu\mu\text{fds}) = .2244 \times K \frac{A}{d}$$

Where:
K is the dielectric constant of the material between plates.
A is the area of the smallest plate. (Sq.In.)
d is the distance between the plates (In.)

From this it is seen that the capacitance is **directly** proportional to the dielectric constant and the plate area, and **inversely** proportional to the spacing. Snce the dielectric constant of air is only 1.0, but is greater than unity for all other insulating materials used in capacitor construction, greater areas must be used in air capacitors to achieve a given capacitance. In addition, the dielectric strength of air is considerably lower than that of the other dielectrics, so that greater electrode spacings are necessary for a given working voltage. As a result, the volume occupied by an air-dielectric capacitor will be at least 500 times greater than that of a comparable capacitor using a high grade mica dielectric.

"Because of these factors, air as a dielectric is used only to a very limited extent in fixed capacitors, such as in certain laboratory capacitance standards. Fixed capacitors using vacuum or an inert gas under pressure are used to a greater extent, since the breakdown voltage is increased about four to ten times thereby. Air dielectric **variable** capacitors are, of course, widely used for tuning r.f. circuits because of their mechanical simplicity.

"In February 1937, the writer constructed a high-power R.F. 'Short-wave' therapy (diathermy) machine operating on approximately 37.5 MHz. Power output approximately 500 watts.

"A fixed capacitor was required and one was constructed using two aluminium plates, each 18" x 12" and spaced ¼", the dielectric being air. The plates were supported by stand-off insulators.

"This capacitor lasted the life of the machine, approx. 20 years. Its capacitance can be calculated from the formula given earlier.

Mica Capacitors

"Mica is widely used as the insulating material in capacitors manufactured primarily for r.f. applications. The mica capacitor is characterized by low power factor, high puncture voltage, good stability, high insulation resistance, and reasonable cost. As mentioned above, the size for a given capacity is considerably smaller than that of a comparable air-dielectric condenser. Due to the stacked construction usually employed, the inductance is quite low. A common construction is illustrated in Fig. 2. The plates consist of metal foil sandwiched between thin sheets of mica dielectric material. The ends of alternate foil strips extend beyond the

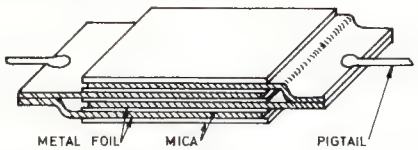


FIG 2 TYPICAL MICA CAPACITOR CONSTRUCTION

mica sheets at opposite ends of the stack and each group is clamped together and connected to a lead. Thus, the charging currents which flow into each plate do so through a relatively short, broad path. Therefore, the inductance is low, being mainly that contributed by the wire leads.

"Mica capacitors are used in a multitude of electronic applications where a high degree of capacitor excellence is required. Such uses include; r.f. fixed tuned circuits, r.f. by-passing, r.f. coupling, d.c. blocking, r.f. neutralizing, r.f. filtering, a.f. tone control, a.f. degenerative feedback, a.f. coupling where high insulation resistance is important (as in certain RC-coupled amplifiers), and many others.

"In radio frequency applications, mica capacitors are rated according to r.f. current handling capability as well as maximum instantaneous voltage. The observance of both of these ratings are equally important in practice. Excessive r.f. current results in capacitor heating, which, in turn, causes increased dielectric losses, capacitance deviation, and lowered breakdown voltage. The effect is thus cumulative. The r.f. current through a capacitor in any given application can be determined by connecting a suitable r.f. thermoammeter in series with it.

"In applications where stability of capacitance value is important, as in tuned circuits, r.f. filters, and other critical circuits, capacitors of the 'silvered mica' variety are used. These units have extreme capacitance stability and low temperature coefficients. These excellent characteristics are obtained by depositing a silver coating on the opposite surfaces of mica wafers and 'sintering'

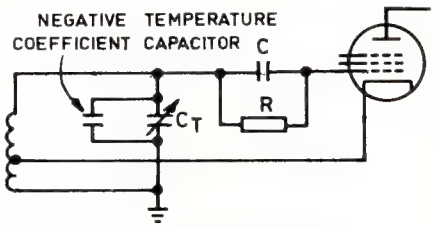


FIG 3 USE OF TEMPERATURE COMPENSATING CAPACITOR

this assembly at high temperature to form highly conducting metal 'plates' in intimate contact with the mica. The variable factor of stacking pressure is thus drastically reduced, with correspondingly improved stability.

High quality mica units are manufactured with either positive, zero, or negative temperature coefficients of capacitance. Capacitors of this type can be used for temperature compensation in tuned LC circuits in which low frequency drift with ambient temperature change is important. By such means, self-excited r.f. oscillators having frequency stability comparable to crystal controlled oscillators can be built. Stabilized oscillators of this type are used for receiver local oscillators, amateur v.f.o.'s, power oscillators where crystal control is impractical, etc. An example of the application of temperature compensating mica capacitors is given in Fig.3. Here it is desired to maintain the LC product (and hence the frequency) of an r.f. oscillator 'tank' circuit at a constant value over a wide temperature range. This may be accomplished by determining the approximate temperature coefficient of the uncompensated circuit in terms of capacitance deviation in parts per million per degree Centigrade. This coefficient will usually be positive with common circuit elements, i.e., the frequency decreases with increasing temperature. Temperature compensation then consists of the selection of a capacitor having a **negative** temperature coefficient approximately equal to the **positive** characteristic of the other circuit elements. Thus, with all circuit elements subjected to the same ambient temperature changes, frequency 'drift' is compensated. A trick frequently resorted to by circuit designers consists of placing the compensating capacitor at a location in the equivalent where a temperature gradient exists, such as near a vacuum tube. A 'vernier control' of temperature compensation is then obtained by adjusting the position of the capacitor within this gradient by trial and error until a point of best frequency stability is located.

The Glass Capacitor

"In the early days of Amateur Radio it was quite commonplace for Amateurs to 'home-brew most of their equipment and fixed high-voltage capacitors were no exception particularly in the days of spark transmitters.

"One such capacitor made by the writer about 1925 used twelve sheets of window pane glass, each sheet one foot square. The sheets, except for the outside of one and 12, were given a coating of Shellac on one side, then leaves of tinfoil placed over the wet Shellac and bonded into position. The final assembly was similar to that of the mica condenser shown in Figure 2. "This capacitor was used in an amateur spark transmitter with a Model T Ford ignition coil as the spark high-voltage supply.

To be continued.

EUROPEAN Amateur
TV REPORTING SYSTEM

Picture Carrier

B0 Nothing receivable from the picture carrier.
B1 A3 sound or speech audible, receiver on AM.
B2 A3 sound visible, speech understandable.
B3 Non-lockable picture visible, A5 rumble available.B4 Lines can be locked, A5 rumble loud.
B5 Lines and picture can be locked.
B6 Call readable.
B7 Persons recognisable.
B8 Picture almost free from noise.
B9 Picture almost free from noise.B8 Details recognisable.
B9+ Picture completely free from noise.
N.B. The TV receiver is switched to AM for B1-B4

Sound Carrier

T0 Nothing receivable from the sound carrier.
T1 Test tones audible, speech unintelligible.
T2 Speech sometimes understandable.
T3 Speech understandable when picture is at black level.
T4 Speech understandable when picture contest is white.
T5 Speech understandable if tuned for best picture.
T6 Poor speech understanding if tuned for best picture.
T7 Good speech understanding if tuned for best picture.
T8 Sound almost free of distortions if tuned for best picture.
T9 Sound completely free of distortions if tuned for best picture

Remarks

B1 The TV receiver is switched to AM. The vision carrier is to be modulated by speech in the A3 mode.B2 Again the TV receiver should be switched to AM. Horizontal bars should appear on the screen if the sound is tone of 200-800 Hz. Whistling into the microphone is an alternative.
B3 Sync pulses should be visible if the brightness is turned up.
B4,5 It should be possible to lock both frame and line by careful adjustment.
B6 The call sign should fill the screen, and it may be necessary to darken the shack to read it.
B7 The picture should be of a well known person, such as the Queen or some local personality.B8 Scales, and the hands of, watches should be discernible.
B9 3 MHz on 625 should be resolved.
B9+ 400V should be available from the aerial
Re-printed from CQ-TV March 1973

CHRIS CULLINAN VK3AXU, WINS THE 1972 HIGGINBOTHAM AWARD.

The Higginbotham Award was described in AR of February 1965 thus — "The Publications Committee decided that as no technical article for 1964 merited the award, it would be better to broaden the scope of this prize to include meritorious service towards "Amateur Radio".

The Publications Committee decided that Chris Cullinan VK3AXU, qualified for the 1972 Higginbotham Award for his consistent contributions to AR over a long period of time. An Award cheque was presented to him recently by Rod Champness VK3UG, on behalf of the Committee and the photograph below, taken by Cyril Maude VK3ZCK, commemorates the occasion at the author's home in Colac.

Chris has been licensed for a great many years and a biographical sketch is being planned for a future issue.

Kerry Adams, VK5SU, winner of the past two Ross Hull VHF contests.

On six metres Kerry used the FT DX401 into an FTV650 to a 4 el beam at 57 feet for CW, AM, FM and SSB contacts.

On two metres, a VK3 pre-amp into a VK3ABP converter into the FT200 was used to receive, and a 15 year old transmitter running 20 watts into a 832 to transmit.

Earlier this year, a lecture Greg VK3YGB and Pet VK3ZPA, was presented to t VK3 VHF Group meeting ATV over a 25 mile path fro Sunbury.

Noisy but perfect "readable" signals were recei ed at the rooms in Ea Melbourne by reflecting signa from a nearby building.

Transmitter was gr modulated, 15 watts output, in a 10 element yagi.

Receiver was a VK3 432 m converter with pre-amp into TV receiver. Antenna was a 2 13 element yagi.

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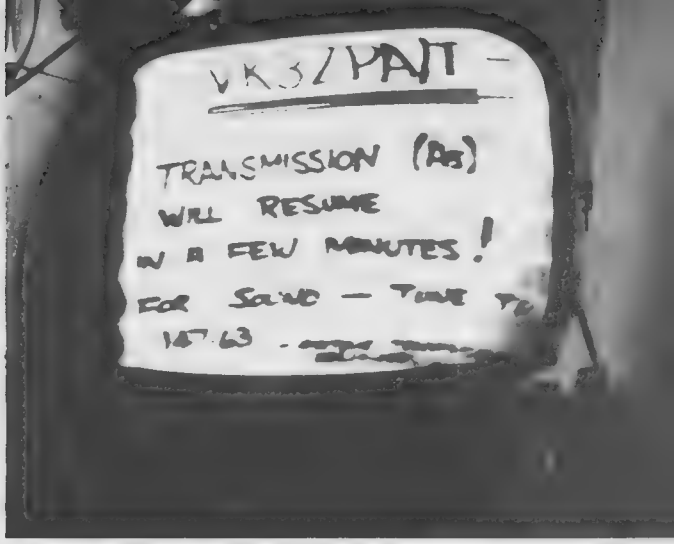

Les Jenkins VK3ZBJ, author of several articles published in AR, demonstrates to his daughter his latest project, a hand held FM transceiver. A descriptive article should appear in a future issue of the magazine.

The Heathkit H.W.7 CW Transceiver

AR TECHNICAL STAFF

For quite a while now manufacturers in the Amateur Equipment business have catered rather well for those of us who required a medium to high power SSB rig. Notably lacking has been any transmitter or transceiver designed for CW operation only.

The Heath H.W.7 takes a novel approach to this aspect of our hobby. The design represents new thinking in almost all respects. Firstly, it is fully transistorised and as such is intended to operate from either a battery or small AC supply. As the transmitter runs a power input of about three watts, it would be quite feasible to operate the rig from a set of torch batteries.

The receiver uses the syncrodyne or direct conversion principle of operation and although it is very simple in overall design, the performance is surprisingly good. Operation is provided on three bands, 40, 20 and 15 meters. The actual coverage being 7.0 to 7.2, 14.0 to 14.2 and 21.0 to 21.3 MHz. The accurately calibrated dial is driven by a smooth-acting planetary drive.

The power requirements are: 12/13 volts DC with a current drain of 35 MA on receive and 450 MA on transmit with the key down. The matching HWA-7-1 power supply will deliver an output of 13 volts regulated at 600 MA with an input of either 110/130 or 220/260 volts 50/60 Hz.

DESIGN FEATURES

The most striking feature of the H.W.7 is the compact construction. The overall size is only 9¼ inches wide, 8½ inches deep and 4¼ inches high including knobs and feet, and the total weight is 4 lbs. 8 ozs.

The majority of the components are assembled on one printed circuit board which takes up most of the space inside the cabinet. The cabinet is made of heavy-gauge aluminium, assembled in such a way as to allow easy access to the various internal components. The finish is in the usual Heath colours, that is, a fine grey crackle for the cabinet and the usual Heath green on the front panel.

Controls include tuning, AF gain, receiver preselector, PA tuning and four push buttons for band selection and crystal or VFO operation for the transmitter section. There is also a crystal socket and a relative power meter for transmitter tune up. Supplied with our test unit was the optional AC power supply, the HWA-7-1.

CIRCUIT DESCRIPTION

The H.W.7 uses twelve transistors and one integrated circuit. As mentioned before the receiver works on the direct conversion principle and uses a dual gate MOSFET as the detector stage. This is followed by a sharp cut-off 2 KHz audio filter which provides the receive selectivity. The one IC is used as the audio amplifier and provides over 100 db of gain to feed to a pair of high impedence headphones.

The heart of the whole unit — the VFO — uses an MPF 105 FET and is followed up with an MPS 6521 silicon transistor which works as a doubler on forty and twenty meters and a tripler on fifteen meters. As we will see later, the VFO has quite exceptional stability in all respects.

The output of the multiplier stage feeds the second gate of the MOSFET detector in the receive mode, or the transmitter driver stage in the transmit mode. The final amplifier uses a pair of MPSU 05's in parallel feeding through a pi-coupler network to a fixed output load of 50 ohms.

All the PA tank coils are wound on miniature toroids which are mounted directly on the printed circuit boards adjacent to the band switches. An interesting feature of the transmitter is that full break-in keying with side tone is provided. Apart from the antenna change over which is relay operated, all the switching is controlled by electronic devices.

The H.W.7 on the Air. Just how does a simple receiver of this type really work? Considering that the RF portion of it really has only one transistor plus the VFO, I am sure the sensitivity will surprise everyone even if they are accustomed t quite sophisticated gear. Heath quotes the sensitivity as less than one microvolt and, in use beside the H.W.7's big brother an SB101 transceiver, it was hard to find a signal on the 101 which could not be copied on the H.W.7.

So, you might well ask, what is the catch. Well of course the price of simplicity must be paid for in quite a few ways.

Firstly, the front end selectivity is determined by one simple tuned circuit. This means in prac-

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1000 Hay Street, PERTH. W.A. Tel. 21 7861.

tice that strong adjacent signals will often be heard as a background to the required signal. Also, unless the receiver preselector control is tuned spot-on, all kinds of out-of-band signals will be heard. Next, the overall gain is rather limited and even with 100 db of gain available in the audio IC it is necessary to use headphones, there is no provision to use a speaker.

It was also noticed that when the preselector was peaked, a strong hum would often peak with it taking out all signals. We found that this effect would either appear or not depending on the location of the unit. The trouble was traced to the matching power supply. Operating from a different regulated supply, the hum problem disappeared. We did not trace the cause further.

The transmitter operation was excellent. The break-in keying was a delight to use with the return to receive delay being adjustable with an internal pre-set control. With a power input of a fraction over three watts, two watts output was measured on all bands. Incidentally, this power level would be ideal to drive a higher power final such as a single 6146 or 807.

The stability of the VFO is rated by Heath as better than 100 Hz drift after 10 minutes warm up. Checked on a frequency counter it was found that the total drift from cold did not exceed 100 Hz on any of the three bands. Quite an exceptional figure when it is realised that the actual VFO drift is either half or a third of this figure due to the multiplication used.

CONCLUSIONS

Just where does a rig of this type fit into the scheme of things. Apart from the obvious things such as portable operation when camping or caravaning, it seems to me that it might be useful to the amateur who has everything, perhaps in the same way that a mini-bike might appeal to the man who drives a Mercedes.

There is no doubt that there is quite a sense of achievement in working DX with low power, and there is no doubt that it can be done on this little rig; we did.

The reviewers wish to thank Schlumberger Instrumentation Australia Pty. Ltd., for the loan of a unit for test and evaluation purposes and from whom further details are available as set out in the advertisement appearing elsewhere in this issue.

6 UP

AUSTRALIA'S NATIONAL VHF/UHF MAGAZINE

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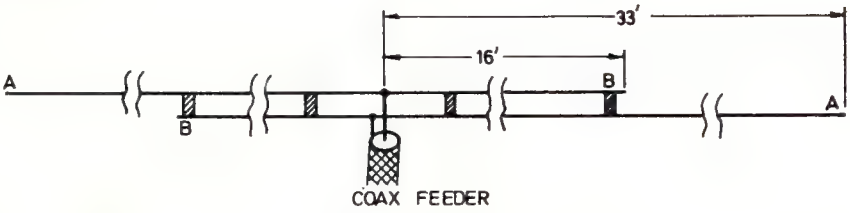
A Simple Three-Band Aerial for Portable Use



A letter received recently from Keith McCarthy VK9AR of Port Moresby gives some details of a simple antenna for 40, 20 and 15 metres. It uses a common 50 ohm coaxial feeder for the three bands, can be constructed in a very short time, and apparently works well.

The material required is a 66 foot length of **open-wire** TV feeder of the type which uses spacer blocks at intervals. Keith describes the construction thus:

"Scrape away the insulation of both wires at the centre. Attach the outer conductor of the 50 ohm coax to one wire and the centre conductor of the coax to the other wire. Then cut **opposite** wires back to 16 feet from the centre feed-point."

Reference to the drawing should make this quite clear. It will be seen that the system amounts to a 40 metre half-wave in parallel with a 20 metre half-wave (A-A and B-B in the drawing). The 40 metre dipole will of course function in three-half-wave mode on 15 metres, and still present an impedance compatible with coax. In spite of the close proximity of the two antennas, Keith claims, "In each case the 'loafing' antenna just doesn't exist as far as the transmitter is concerned."

He goes on to suggest that use of insulators at each end would permit the antenna to be used horizontally. "However the writer has had best results with the aerial hung from one end and a weight at the other." Suspended from the mast of the motor yacht "Pandemonium", no doubt?

Bill Rice VK3ABP
Technical Editor

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— this top flight
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Calibration accuracy	Within 5 KHz at all frequencies
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Selectivity	6 KHz overall RF on AM 3 KHz overall RF on SSB and CW
Audio output power	0.5 watt (150 Hz to 3 KHz)
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Frequency stability	Will hold an AM transmission in tune indefinitely Will hold an SSB transmission on pitch for long periods of time
Image Rejection	50 db on all movable image channels 60 db and better on immovable image channels
Antenna	Self contained telescopic whip antenna External open wire socket and earth
Audio Output Provision	External speaker headphone socket (8 ohms)
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Logging Facilities	Log cards in flip up holder
Power Supply	6 type "D" (1.5v) dry cells (9 volts) External power socket and built in voltage regulator provides for the use of the radio from external DC power sources of 6 to 12 V
Current consumption	20 mA quiescent
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NEWCOMER'S NOTEBOOK

With Rodney Champness,* VK3UG

Learning Morse Code, Sending Part IIc "Brass Pounding".

This is the coloquial term for the manipulation of the morse key. If you talk with a number of CW operators you will find there are two or three different methods of sending with the normal hand key. The way to grasp the key is shown in figure 1, and is common to all variants of sending posture. I will endeavour to outline two methods. It will then be up to you to use the method you personally find satisfactory.

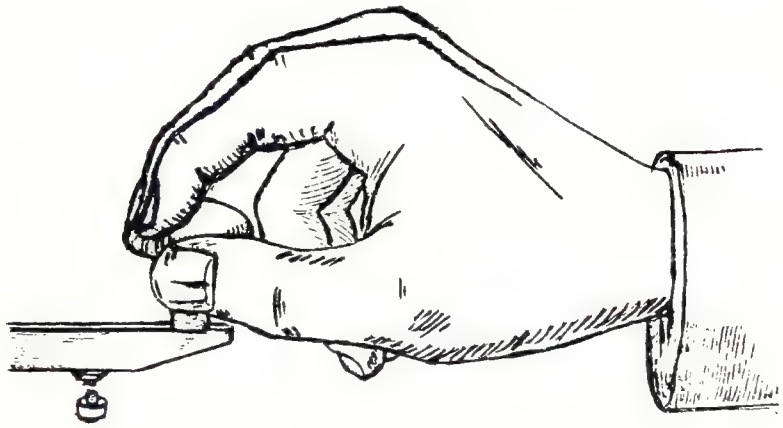


FIG.1.

One method required you to rest your elbow on the table and the second expressly forbids it. The former for want of a better name could be called the American method and the latter the British-Australian method. I have tried both, and found the American method good as have many others. Ken Gillespie found he could send better quality morse using the British-Australian method. This is the most used method here. The key, no matter which method of sending is used, must be firmly mounted on the sending table (or held by the left hand, but this tends to make sending more difficult).

THE BRITISH-AUSTRALIAN METHOD

When sending, sit squarely at your table, with your seat at such a height that your forearm is horizontal and in a straight line with the key lever. If the chair isn't high enough a cushion can be used to raise its height. The right upper arm should hang loosely below the shoulder slightly out from the body. Any tendency to carry the elbow out away from the body towards the line of the shoulder should be corrected immediately.

The left hand is placed on the table to hold the key, or to underline a text that is being sent, or just resting there. In my case I adjust my receiver for monitoring purposes and the checking of other transmissions during breaks in my transmissions.

Form the right hand into an arch and lightly rest the tips of the first and second fingers on the top of knob of the key, with the ball of the thumb on the left hand side of the knob as shown in figure 1. For knobs fitted with a thumb-plate, the thumb rests on that as well. The fingers are fairly loose, muscles are relaxed, and a definite grip should be avoided.

To make a "dit" drop the wrist down level with the elbow, bringing the lower arm parallel with the floor — then immediately to the up position. For a "dit" the key is not held down; the action is a continuous one, down and up. A "dah" is made in the same way as a "dit" except that the wrist is left in the down position for a period of three "dits" before returning it ot the normal position. Do not use force in any of these movements, and above all, avoid nerve sending (i.e. with a stiff wrist, fingers only flexing) or exaggerated wrist movement.

A newcomer to morse telegraphy may experience difficulty in judging the time for the "dahs", or "singing" them as you send, as you did for receive, will help to get the correct length of character. This will help you to develop sending which has a rhythm to it.

THE AMERICAN METHOD

The key is grasped in the same way as the previous method. The forearm should rest comfortably on the table. The key should be placed far enough back on the table so that the elbow can rest on the table. If this is not done, pressure of the table edge on the arm will restrict blood flow in many cases, resulting in fatigue of the arm. This will tend to upset both accuracy and the time the operator can send without rest. The wrist action using this method is identical to the previous method, and duplication of the common information is unnecessary.

SUMMARY

You should aim for good formation and regularity of spacing, rather than speed. Ask a proficient telegraphist to criticise your sending soon after you start practising — if possible even before. There are a number of inferior morse senders on the air — unfortunately — I hope you won't be one of them. Send morse of the quality and speed that you would like to receive. It must be sent correctly to be received correctly.

The characteristics of good morse code are:

All dots should be the same length, at the same speed.

All dashes should be the same length, at the same speed.

Consecutive dots and dashes in one letter should be equally spaced.

Letters should be equally spaced.

Words should be equally spaced.

SUMMARY OF THE MORSE CODE SERIES

With patience, morse code reception and transmission can be mastered by most people to examination standard within six months. Receiving practice can be obtained on the air from various stations, from records or tapes, or via an accomplished friend's personal tuition. The WIA do have personal classes in many States.

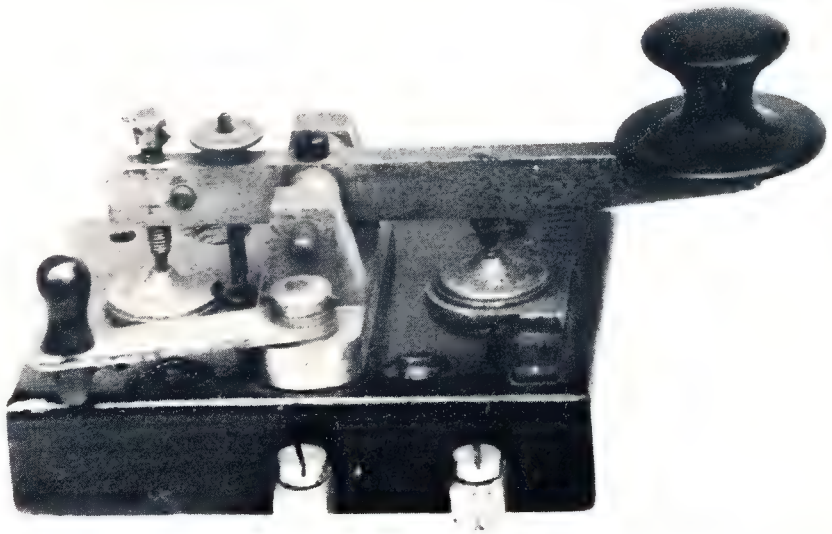
A good key is essential if good morse is to be sent. A cheap "beginners" key is a waste of money.

An audio monitor, either a buzzer or an audio oscillator system is necessary accurately to check your sending ability.

Good wrist action is necessary for effortless quality sending. If possible have a competent telegraphist criticise both your sending and receiving. Finally I wish to thank Ken Gillespie, VK3GK, for his valued help in the compilation of this series of articles on morse code.

Next month I hope to have the promised article on basic test instruments for the amateur station. Unfortunately my workshop has not materialised, due — so I'm told — to scarcity of some building materials, hence a few of the practical articles have been considerably delayed.

Thank you to those who have written with suggestions for future articles. Do you-the-newcomer-think that the articles have been suitable for you? I would appreciate further letters which will help me to plan future articles.



*44 Rathmullen Rd., Boronia, Vic. 3155.

Commercial Kinks

With Ron Fisher,* VK3OM

This month a few words on servicing communications receivers, a trouble-shooting guide on the Yaesu FT 400 transceiver and a few items of interest to mobile operators.

SERVICING COMMUNICATIONS RECEIVERS

I hope that readers are not expecting a quick and easy run down on how to fix that particular fault in that favourite receiver of yours.

Indeed this article is more a collection of things **NOT** to do. One of the things most asked for in correspondence to this column is advice on how to line up this or that receiver. I often wonder why. Unless a receiver has been deliberately tampered with in some way, it is almost certain that the last thing it needs is a realignment.

After the initial thrill has worn off that new receiver our friend decides that perhaps the performance is not up to what it should be. What could be wrong? Must need lining up, and before long we do indeed have a set that does need lining up.

Resist that temptation to just peak it up a little. Now you might well ask — how do I know when the set is dropping off a bit. One thing I have got into the habit of doing with receivers over the years is to check the S meter reading against a standard signal, such as the built-in crystal calibrator. Make a note in the back of your log book of the S meter reading on a particular frequency on each band.

Probably most of the trouble in receivers is caused by defective valves. I feel it is always wise to have a spare set on hand so that you can exchange them from time to time to keep a check on performance. However make sure you do not get the new ones and the old ones mixed up.

After that if you still insist that your set needs lining up and you haven't the required data, drop me a line, I might be able to help.

THE FT 400 TRANSCEIVER

Once again I am indebted to Mr. Fred Bail of Bail Electronics for the following service details on the FT 400. While a few of these may seem to be self evident, it is nevertheless easy to overlook simple faults.

Symptom. Low output on all bands. Transmitter flat-tops at low output levels. **Probable cause:** Weak PA valves. Bias reduced to compensate. **Cure:** A low grid bias in the valves could cause grid current to be drawn at low drive causing saturation. Check and replace PA valves.

Symptom. Loss of output on one band only. **Probable cause:** Dry joint in driver plate coil. (6GK6). **Cure:** Repair or resolder coil. Check band switch contacts.

Symptom. Intermittent loss of IC meter indication. Transmitter output remains OK. **Probable cause:** Faulty meter or relay. **Cure:** Check and clean contacts of relay RL1 which changes over the meter functions.

Symptom. Antenna relay inoperative. **Probable cause:** Loose resistor R517 on power supply board. **Cure:** Check and resolder. Also check relay coil for continuity.

Symptom. Receiver sensitivity reduced intermittently during operation. **Probable cause:** Poor contacts in antenna relay. **Cure:** Clean contacts.

Symptom. ALC inoperative or ALC meter reading low. **Probable cause:** Valve V204 (6BA6). **Cure:** Replace valve. Check circuitry. Also check PA valves.

Symptom. VFO linearity poor after half an hour warm-up. **Probably cause:** VFO tuning capacitor stator-plate loose. **Cure:** Tighten stator-plate. Check tuning capacitor for any mechanical defects.

Symptom. Variation of resting IC reading. **Probable cause:** Faulty PA valves. **Cure:** Replace valves. Check bias voltage.

Symptom. VFO drops out of oscillation below 250 on the black scale. May be accompanied by spurious signals and birdies on receiver appearing on each side of filter. **Probable cause:** Dry joints in the VFO printed circuit board. **Cure:** Solder eyelets etc. on the board. Also check contact fingers on the VFO tuning capacitor. Clean with Pressure Pack contact cleaner.

Symptom. Drift in VFO when clarifier switch is in receiver position. Drift appears only on transmission. **Probable cause:** Cnnection of wire from R9 and R10 to receive position of S3a. Also could be contacts on relay RL1. **Cure:** Check continuity and solder where necessary. Clean relay contacts.

Symptom. Calibrator signal weak or intermittent. **Probable cause:** Faulty connections or dry joints on calibrator printed circuit board. **Cure:** Check voltages on board. Re-solder eyelets, rivets and supply voltage tags.

Symptom. VFO jumping in frequency after warm-up. **Probable cause:** Components and leads in wire eyelets on VFO printed circuit board not soldered to copper laminate. **Cure:** Remove board and re-solder all eyelets and components.

Symptom. VFO jumping in frequency during tuning. **Probable cause:** Bad contact between tuning capacitor wiper forks and shaft. **Cure:** First try cleaning with pressure-pack contact cleaner. If no improvement, remove forks, re-tension and replace in position.

Symptom. Pulling or FM-ing of VFO frequency on voice peaks. **Probable cause:** Defect in voltage regulator causing slight variation in regulated voltage to VFO. **Cure:** Check voltage regulator components, check for correct input voltage to VR circuits.

Symptom. Transmitter output down and poor CRO pattern on low bands. OK on 10 meter band and OK on 15 meter band, but plate tuning at 40 meter position. **Probable cause;** 15 meter tap shorted to 10 meter tap on PA coil HT lead to PA RFC insulation burnt. PA coil slightly discoloured showing signs of overheating. **Cure:** Separate and re-solder any shorted taps.

As there must be quite a number of FT400's about, perhaps our readers could add to the above trouble guide. In the meantime our thanks again to Fred Bail.

COMMERCIAL INTEREST

Whilst I was collecting the above information from Fred, I spent some time browsing round some of the many bits and pieces that he has in stock. I picked out the following as an interesting group for the mobile man.

There are three types of filters to reduce noise caused by generators and alternators. First the "Dot Line" AF 104 non-tunable alternator filter. This unit is easily connected to the average car and according to reports does a first rate job.

The "Dot Line" generator filter is of the tunable type, and instructions are included on how to tune it to your favourite band.

Also available is a coax type capacitor designed to be fitted into the field lead of the car electrical system. All these units are priced at $9 each and of course further details are obtainable from Bail Electronics.

Next month, the long awaited FT200 noise Blanker. I am sure a lot of people are waiting for this.

*3 Fairview Ave., Glen Waverley, 3150.

AR

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2-16	5/8	16	3	No. 3007	88c
3-08	3/4	8	3	No. 3010	$1.06
3-16	3/4	16	3	No. 3011	$1.06
4-08	1	8	3	No. 3014	$1.19
0-16	1	16	3	No. 3015	$1.19
5-08	1 1/4	8	4	No. 3018	$1.32
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References: A.R.R.L. Handbook, 1961; "QST," March, 1959; "Amateur Radio," Dec. 1959.

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you and DX

With Don Grantley*

Times: GMT

Many thanks to those of you who have written in this month, and believe me your letters are appreciated, although it may be some time before they get answered. Quite a lot of news to hand for this issue, so without further ado let's have a look firstly at Geoff Watts DX News Sheet.

Once again we have quite a number of prefixes which are of use only to those who specialise in that form of scoring. I will list them here with any information provided about their activity. TY3ABF says QSL to DL8OA, whilst TY5ABK has been noted on 14206 ssb at around 1300z. Bux YB9ABH on ssb 14280 at 0900, QSL to 30-P River Valley Close, Singapore 9.GB5SC operation for the period March 6 to 10 incl. commemorates the 50th anniversary of the Glascow BBC station 5SC. YA0CDRC is the club station for the Camel Drivers' Radio Club which is QRV on 14285 ssb Saturday and Sunday at 1230z, with net control YA1AH, but like all others in this section, he is valid for prefix hunters only. As well as these, FC6CKM, GD2HCX, IV5LN, XG1J and 7X0GM have been active in the past weeks.

A batch of mail for 9M80EA and 9M8SPD has apparently been lost and it is suggested that anybody who has not yet received their QSL for those operations, should contact the operator, Charles E. Schaub, Regional Relay Facility, PSC No. 2, Box 19047, APO, San Francisco, 96274, USA.

Recent operation by Tony 7P8AC should be completed at this point. However, he hoped to resume from 3D6 towards the end of April. Manager for his efforts is W2GLU. By the way, 7P8AB still remains active, and his cards should go direct to Dr. A. Jacques, P.O. Box 389, Maseru.

XT2 is well represented these days with XT2AF who has been worked on 14215 at 2240z, manager being VE2JH. XT2AJ, heard on 21 MHz at 1400 is Claude, ex-FH8CG. XT2AK is Michel ex-F5XU/FR7AF, and has been noted on 14 MHz at around 1800z, manager is F6AXP, whilst to round it up, XT2AA will shortly be QRV with RTTY.

VQ9HCS after having a very good session from Aldabra Is., went QRT on March 23rd and has returned to England, but shortly it is expected that he will activate either Astove or Farquhar Is. Manager is WA1HAA.

Whilst in the VQ9 area, Bob WA1RDH/VQ9 who has been operating from Chagos will return to the States shortly, in fact he should be there by the time you read this. After a stay at home, he will return to ET3. Manager will remain W4WFL.

In October last, KH6HLK/KH6 was on the air from Kure Is., and for some reason the wrong QSL manager was given, cards should in fact go direct to KH6HLK. At the same time as this operation, K5CH/KH6 was understood by some also to be on from Kure, but this was not the case and his cards should be sent to Captain Joseph Locascio, 98 1325 Akaaka St., Aiea, Hawaii, 96701.

Currently there is quite a bit of activity from the Pacific Area, KJ5CF on 14 ssb at about 0500, KJ6BZ Paul at about 14300 late afternoon VK time, as is KS6ER who appears at about 0700z. JD1AHC from Marcus Is. 14180 at about 0700z working to a list from OK1HA, also Sundays at about 14300 timed 0600z working to a list from one of his countrymen. He has been reported from the States on 14025 cw at 0030z. VR1O by the way has returned home and any outstanding cards can go to him as G3NRA David Appleton, 3 Boyne Rise, Kingsworthy, Winchester, Hants. Back to the Pacific area again, the YJ8's are represented by YJ8DE who is usually in the Pacific net, YJ8DS sometimes on 14269 at 0900z, YJ8EE Jack, QRV daily 14262 at 0745, whilst 3D2DM was due to appear as YJ8 on 14010 and 21110 CW for three weeks from March 19.

ZL3KK/C from Chatham Is., due to go QRT at the end of March, cards should go to ZM4CR, VR1AA went QRT on March 20, but will reopen from the same QTH at some time in September for a further two years. KX6RA Rudy is on from Majuro Is., 14305 at 0800 in the Micronesia Net, QTH Rudolf Aliven, Box 285, Majuro Marshall Is. 96701.

The gentlemen of the DX world are saying some kind things about VK3FF (ex-VK0PF) in his handling of the current operation from Macquarie Is. by VK0WW; seems that the QSL's really fly along quite rapidly.

During April 1971, WB8ABN and wife HC1MM were involved in a jaunt which covered F0MH, FG0MH, FG0MH/VE3, PJ8RD, VP2AAD, VP2AZ, VP2EEL, WB8ABN/HC1, WB8ABN/HK0, ZF1CW and C31ED, Maria alone was on from HC1NMM and HK0. They are about to close their logs for this jaunt, so if you missed out it would be advisable to contact them at once. Address OK in the call book.

VE8DJ Dave is active from Victoria Is. in Zone 1, he did a fb job from there during the past ARRL contest on March 17, and put out a very good signal on 7005. Manager is VE3DAM, but this home address for those who want to contact him direct is David McKerrow, Dewline Station, Cambridge Bay, Victoria Is., NWT.

Operation from Spratley Is. by IS1A was apparently a most interesting one, in that it was con ducted in the worst conditions ever. Bad enough that they had to do the trip in a 65 ft. ex-army Q-boat in winds nearing 30 knots and seas running some 30 ft. high, but worse was to come when Pete HS4AGN was swept away in a whaleboat whilst ferrying supplies to the island. He was safely rescued from the open sea some eight hours later. The operation was a great success, many contacts being made on all bands. Manager for the trip was W1YRC.

SHORT JOTS

The K4 operation to 3A0 scheduled for early this year was cancelled. Watch 7084 ssb daily at about 0615 for a possible appearance by the 5N2 gang. 5R8AG on 14020 at 1800, QTH is Box 60, Ivato Aeroport, Madagascar. Dave 6Y5DB, ex-VE3EDG on 7003 CW at 0530z. Manager is VE3EDC. QSL's for A35FX go to George, ZL2AFZ. OK5KBB operation from March 5 to 11 from military winter sports championship, Donovaly. QSL to OK3CIB. TL8LI now back in France as F6BFH, to whom all cards should be sent. QSL's for CR8AG now go to CT1SH. F9MS is manager for only FR7ZU/E/G and T. please don't send any other FR7 cards to him. Tom MP4TEE 14160 at 1500 working manage G3LQP, says his call has changed to A6XF a from March 31.

AWARDS

These are now covered by a special section, anc I no longer list them here. However Geoff Watt's news sheet No. 564 lists three newies, HQ25HG WAHC Ecuador, and the RAEM Certificate. I you want the info, drop me a "sase" and quote th DXNS number.

Speaking of Geoff Watts, as I often do, h reminds me the new edition of the W6GSV DX Managers' director is now available from him, apparently you send Geoff your order plus the equivalent of 2db sterling, and it is mailed direct from the States. More info or order to Geoff Watts DX News Sheet, 62 Belmore Road, Norwich, NOR 72-T, England. Geoff supplies us with most of the news in this page.

I must close at this stage, but before I do, an SOS from Murray VK4KX/5Z7OA, Brian ex-VR2FY, Box 30772, Nairobi, is anxious to contact John Weatherly, last heard of at Woomera. Should any of our chaps know him, would you please pass this on.

* P.O. Box 26, Imbil, Qld. 4570.

Why Not Try Double Sideband?

(Continued from page 5)

TESTING PROCEDURES

Connect a dummy load to the antenna output co-ax. Set up for 7 MHz C.W. (If you have built a dsb rig only you will have to provide a 9100 ohms screen dropping resistor and unbalance the 807s by breaking one cathode circuit.) With no H.T. applied to screens or plates, switch on your 7 MHz RF drive and tune the split-stator grid capacitor for maximum grid current, about 8ma. Now apply H.T. to screens and plates and adjust plate tuning capacitor and loading capacitor in the usual way. Use your absorption wavemeter to check the presence of 7 MHz radio frequency energy at the transmitter dummy load. Take a note of these 7 MHz C.W. screen and plate current readings. You are now ready to test the carrier suppression. Switch to the 7 MHz dsb condition, disconnect the modulation transformer from the 807 screens and connect the screens in parallel to the dropping resistor. Apply H.T. and with aid of the absorption meter check whether any RF at 7 MHz is present in the plate tank circuit. If the grid circuit is properly balanced there will be no indication of RF output. If there is RF output you will have to balance the system by one of two methods (1) wire a trimmer capacitor from one 807 grid to earth or (2) re-arrange the cathode circuit so that a variable resistor in one cathode can be used to adjust the plate current of one tube. Obviously method (1) is easier. Make your adjustment for proper balancing. However, I did not find any such adjustment necessary. Make a note of plate and screen currents. You can now proceed to test your rig to ascertain whether it performs as a dsb transmitter.

Remove the dropping resistor from the screens and re-connect the modulation transformer. With the modulator or microphone switched off, apply high tension. Because the screens have, in the absence of modulation, no high tension applied, there will be no plate current. Now bring in your modulator and adjust its gain so that the screen and plate currents kick up to about 2/3 of the previously noted values. At this stage (unless you are lucky enough to have some sophisticated test equipment available) you should enlist the aid of an Amateur about one mile distant. Get him to listen on his ssb receiver and adjust your modulation level until he reports your modulated bandwidth as about 6 KHz. Ask him to listen for splatter. When you are satisfied that your dsb signal is satisfactory take a note of the screen and plate current peaks and use either as a rudimentary modulation monitor.

I realise I am being cheeky in questioning anything written in the R.S.G.B. Handbook but I do question their statement that dsb "cannot be received without special equipment". Any reasonable quality ssb receiver will easily resolve dsb. The ssb operator, will, on 7 MHz, hear the unwanted (upper) sideband as inverted (quack-quack) speech. He may, if he has the facility, switch sidebands and resolve your upper sideband but in practice I suspect most ssb operators keep switched to lower sideband on 7 MHz. Therefore the ssb operator will resolve your lower sideband signal and be quite uninterested in your unwanted upper sideband.

(Continued on page 24)

TECHNICAL CORRESPONDENCE

The following letter to VK3CIF from Louis Varney G5RV (ex VK9LV) is printed for information.

Dear Peter,

I have just received "Amateur Radio" for January 1973 and was glad to see that you had printed the article (from "Ohm" magazine) on the G5RV antenna. As we left VK9 on May 3 1972, and spent three months leave travelling to the UK via several of the Pacific islands and several South American countries your letter of May 5 eventually caught up with me after we arrived home at the end of July last year. Frankly, I cannot remember if I sent a copy of the "Ohm" Article to you or not, I certainly intended to do so as I have not been able to find time to do a re-write because of many things that happened since our return — not least, a very serious motor accident in which I was involved — a head-on collision with another car in which I had two badly smashed feet and was in hospital and then recovering for four months! Still have considerable pain in the left foot but can now walk again OK and have just started to drive my car again! Thank goodness, I was wearing my seat belt, or I would have put my head through the windscreen — with very probably fatal results! This accident happened at the end of August last year, just a month after arriving in the UK.

One or two points that you may care to publish as a "follow-on" to the article:

1. 2nd para. 6th line, last word — for "two" read ½
2. 11th para. Reference to the use of the G3HZP balun — NOT now recommended. Tests show that, due to the wide reactance changes at the lower end of the 34 ft. stub at various frequencies, the advantage of using such a balun is questionable. It is excellent on 14 MHz but not really advantageous on the other bands.
3. It should have been mentioned that the G5RV works excellently in the form of an "inverted V" antenna. I used one with great success for six months while in Belgium as ON8RV in 1970.
4. Two G5RV antennas stacked, one 24 ft. above the other, preferably with the lower one a quarter wave (17.5 ft.) above ground, with the 34 ft. matching stub **transposed** and the "slack" suitably taken up by folding or suitably pulling out to one side or other of the array by means of a nylon cord, will act as a multi-band version of the "Lazy-H". This arrangement has given excellent results and has been used for many years by Pete Broome, G5DQ.

If you decide to publish these points, please also QSP73 from my XYL Nelida and myself to all the VK amateurs and especially to all those and their XYLs and families whom we had the pleasure to meet either in VK9 or in VK2, 3, 4 and 5 during our visits to Australia. We think the Aussies are a GREAT lot and will always remember them with pleasure and gratitude for their hospitality and real friendship.

Finally, I should like to say that I consider it a great honour to have held an Australian amateur licence and would be glad if you could mention this fact in "AR".

Yours
Louis Varney
G5RV (ex VK9LV)

PS. I am very proud to have qualified for the WIA DXCC certificate which has a place of honour on my radio room wall (this was for my VK9LV activities).

BOOK REVIEW

With Syd. Clark, VKASC.

"Television Interference Manual"

"Television interference is one of the most challenging problems facing the radio amateur today. While many cases of interference are due solely to deficiencies in modern electronic entertainment equipment, there are certain basic requirements with which the radio amateur must be familiar. This Manual examines the problems and suggests remedies. It also provides a wealth of technical information on many aspects of electromagnetic compatability."

The above extract from a letter accompanying the review copy of "Television Interference Manual", puts in concise form what the book aims to do. This is a British book, so due allowance must be made for the differences between the British TV systems and ours, and the fact that 75 ohm coaxial cable is used practically exclusively for TV feeder whereas we use mostly 300 ohm ribbon. The book not only deals with TVinterference but with the ever more common trouble of Hi-Fi-itis, or more plainly — interference to your neighbour's Hi-Fi system (EMC as they label it now). Cursory mention is made of broadcast band interference, and no mention is made of interference suffered by the amateur operator.

This book, despite a few minor limitations, is a wise investment for the amateur who values good neighbourly relationships. You won't learn everything there is to learn about TVI and how to cure it, but what it does say will put you on the right track.

Review copy received from RSGB through Magpubs. Cover price in the U.K. is shown as 0.80 pound.

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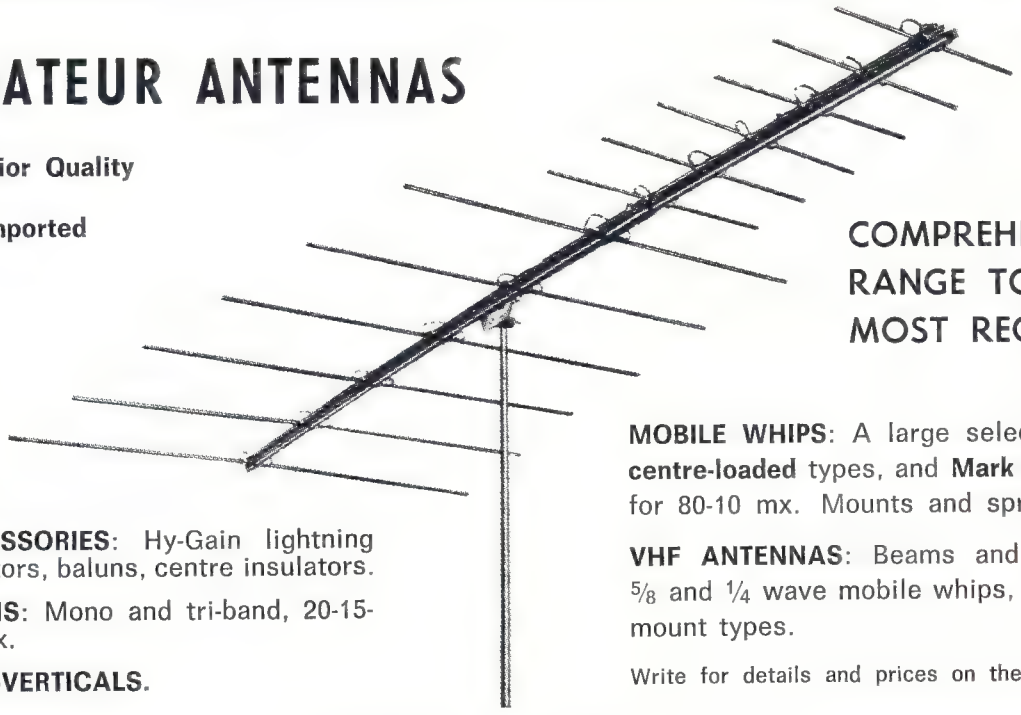

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VHF UHF

an expanding world

With Eric Jamieson,* VK5LP

Closing date for copy: 30th of month.
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	53.100	VK0MA Mawson.
VK2	52.450	VK2WI Dural.
VK3	144.700	VK3RTG Vermont.
	144.925	VK3QZ Traralgon.
VK4	52.600	VK4WI/2 Townsville.
	144.400	VK4WI/1 Mt. Mowbullan.
VK5	53.000	VK5VF Mt. Lofty.
	144.800	VK5VF Mt. Lofty.
VK6	52.006	VK6VF (VK6RTV) Bickley.
	52.900	VK6TS (VK6RTT) Carnarvon.
	144.500	VK6RTW Albany.
	145.000	VK6VF (VK6RTV) Bickley.
VK7	144.900	VK7VF (VK7RTX) Devonport.
VK8	52.200	VK8VF Darwin.
ZL1	145.100	ZL1VHF Auckland.
ZL2	145.200	ZL2VHF Wellington.
	145.250	ZL2VHP Palmerston North.
	431.850	ZL2VHP Palmerston North.
ZL3	145.300	ZL3VHF Christchurch.
ZL4	145.400	ZL4VHF Dunedin.
JA	52.500	JA1IGY Japan.
HL	50.100)	HL9WI South Korea.
	52.010)	
KX6	50.110	KX6HK Marshall Islands.

Various other beacons throughout the Pacific area operate on 50.100. There are rumours of a six metre beacon on 52.910 said to be operating or about to operate from Kalgoorlie with the call sign VK6RTU. Any news on this one please?

The West Australian VHF Group News Bulletin mentions the new solid state beacon to replace VK6VF is progressing gradually towards a finish, a further three months work at least.

Wonder if the VK1 beacon has been licenced yet?

Perhaps this column can lend support to the Geelong Amateur Radio & TV Club's campaign "RETURN TO TWO". There has most certainly been a large decline in two metre activity during the past few years, and it is noticeable that a lot of the present operators on the tunable section of that band are amateurs with full calls and those who have had their calls for a long time. It seems those who built their equipment in the 1955 to 1965 era (or thereabouts) don't easily give up. Many such rigs have been updated and now run SSB. When the chips are down, the oldies are there! The Geelong campaign hopes to stir more stations into activity on two metres, perhaps with properly recognised calling frequencies, e.g. 52.050 and 144.050, for any mode. Suggested back-up HF frequencies of 7090 and 14120, plus use of the local FM net.

One could go on a lot about two metres but this is enough for the present, hopefully the winter months might see an increase in the activity, culminating in some possible good contacts as the usual Es season comes around again in December. Despite what the sceptics say, two metres will surely provide some good DX during early summer months for the next few years, you wait and see!

6 UP RE-APPEARS!

After being missing from the VHF scene for five months, the controversial VHF magazine "6 UP" has re-appeared as an independent publication with Roger Harrison VK2ZTB as Editor. The March issue has set a very good pattern for reading, we wish them well. I commend the article headed "Meteor Scatter Propogation" by Rod VK2ZQJ as something really worth reading. Running in the March issue to five pages it is the first of a series and may well serve to stir some additional amateurs to take an interest in meteor scatter.

Although somewhat dated now, the exploits of Roger VK2ZTB on Cocos Island should be of interest to most if only because it concerns operation from a little known area. "On Cocos Island", Roger VK2ZTB, operated a beacon continuously from 1.12.72 to 8.1.73, running 30 watts output, voice ident on 52.210 MHz, it was heard in Perth by Danny VK6ZFF on 12.12.72 at about 0700 Perth time. On 7.11.72 the Darwin beacon was heard in Cocos Is. for a period greater than seven hours at good strength! No Darwin stations though. A long chart recording and a short tape were made of this event. "Vladivostok TV and the Korean broadcasting service stations were heard on a number of occasions in September-November as well as the beacon in Seoul, HL9WI. JA1IGY on 52.500 MHz was heard on several occasions along with some AM and SSB stations but no QSO's eventuated. TEP signals were heard past 100 MHz on several occasions. Unfortunately, owing to antenna limitations, signals were weak above 70 MHz and not recognisable. COME ON YOU Darwin blokes, when are you going to have a go at 144 MHz TEP?" ... from 6 UP.

BENDIGO REPEATER

John VK3AAA, the Translator Project Leader for the Midland Zone of the W.I.A., Victorian Div., has taken the trouble to write and advise me that the licence for the operation of their repeater on Ch.4 has been received, and as it contains conditions not previously required in Victoria, they may be of interest to other groups intending to apply for a licence. Briefly they are: Channel 4; 146.4 MHz input, 145.9 MHz output, emission F3 ± 15 KHz, authorised transmitter power, 50 watts. Suitable arrangements are to be made for:

(a) the prompt termination of transmission at the request of an Officer of the Radio Section.
(b) security of the equipment including the prevention of access by unauthorised persons.
(c) adequate and regular maintenance procedures.
(d) regular monitoring of transmissions by responsible Amateurs.
(e) adequate log keeping entries; should include actual transmission times, input power and frequency meter readings at regular maintenance inspections, a record of repairs and adjustments carried out and any other relevant information.
(f) fail safe operation — design must be such that it is impossible for the transmitter to "lock-on" in the absence of a received carrier, because of the failure of any component.
(g) means of access to the installation by departmental Officers at any time.
(h) no transmissions to be made in the absence of a received signal.
(i) automatic shut down to be effected by the application of an unmodulated carrier of five minutes duration by any transmitting station.
(j) the group to nominate a suitably qualified person or persons willing to accept responsibility for the operation of the station.
(k) all repeaters to incorporate facilities for automatic identification of all emissions.

The repeater call sign is generated in morse code by a digital identifier which frequency shift keys the outgoing signal. This means the identification is not audible in FM receivers and so does not affect normal operation through the system, but can easily read for monitoring purposes on a tunable receiver with a BFO. Code speed is approx. 10 w.p.m. and the call sign is repeated every 10 seconds while the carrier is on the air. The user stations do not announce the repeater call as this has not been required by the Department.

GROUP AND CLUB MAGAZINES

Throughout each month I receive a number of Newsletters and Bulletins from various Groups and Clubs. Those regularly received: "The Victorian VHF-er", journal of the VHF Group, Victorian Division of W.I.A.; "G.A.R.C." Newsletter from the Geelong Amateur Radio and TV Club; "Q.R.M." from the Northern Zone of W.I.A. of VK7; "West Australian VHF Group Bulletin"; "Tuned Lines", Official Journal of the VHF and TV Group, N.S.W. Division of W.I.A.; "6 UP" published by Amateur Communications Advancements, 47 Ballast Point Road, Birchgrove, N.S.W. I have received an occasional copy of "Back Scatter" from the Townsville Radio Club, and the first two copies of "Blurb", journal of the South East Radio Group, Mt. Gambier, S.A. I know there are a number of other Club bulletins circulating, I would certainly be pleased to be placed on your mailing list and so give your Club an opportunity of a mention from time to time in these pages. I feel I should make it known that I don't pay for any of these bulletins, the cost of joining every organisation to obtain copies would be rather heavy on my purse, but it appears each organisation is willing to send me a copy of their news gratis and this is greatly appreciated. In return I quote from their news whenever items of national interest turn up, and due acknowledgement is given. Thanks fellas!

That's all for now, closing with the thought for the month: "A big corporation is more or less blamed for being big. It is big only because it gives service. If it doesn't give service, it gets small faster than it grew." 'Til next time.

"The Voice in the Hills" HR

*Forreston, S.A. 5233

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Ionospheric Predictions

With Bruce Bathols, VK3ASE May, 1973

IONOSPHERIC PREDICTIONS FOR MAY 1973

Hereunder are the predicted band openings for May 1973 from information supplied by the Ionospheric Prediction Service Division. Times are G.M.T.

28 MHz		
VK2	to KH6	2400-0400
,,	,, VK9	2300-0100, 0300-0500
,,	,, W6	0100,0300
,,	,, JA	0200
VK6	,, SU	0900
,,	,, KH6	2400-0600
,,	,, ZS	0700-0900
,,	,, JA	0200-1100
,,	,, 9G1 S.P.	0700-0900
21 MHz		
tlVK2	,, ZL	2200-0500
,,	,, SU	0300-0800
,,	,, KH6	2000-0700
,,	,, ZS	0500-0800
,,	,, G S.P.	0800
,,	,, ,, L.P.	2200
,,	,, VKO	2300-0600
,,	,, VE3 S.P.	2400-0100
,,	,, ,, L.P.	2300-2400
,,	,, UA	0400-0800
,,	,, W1	2200-0200
,,	,, VK9	2300-0800
,,	,, W6	2000-0500
,,	,, JA	2100-0800
,,	,, 9G1 S.P.	0600-0800
,,	,, ,, L.P.	0700,2000-2100
VK6	,, SU	0300-1100
,,	,, ZS	0500-1100
,,	,, G S.P.	0600-1100
,,	,, UA	0300-1100
,,	,, PY	1000
14 MHz		
VK2	,, ZL	2000-0800
,, ,, SU		1200-1900, 2100-0300
,,	,, KH6	0200-2000
,,	,, ZS	0400-1100
,,	,, G S.P.	0900-1800, 2100-0100
,,	,, ,, L.P.	2000-1000
,,	,, VKO	2100-0900
,,	,, VE3 S.P.	0200-0500, 1100-1600
,,	,, ,, L.P.	2200-0300
,,	,, UA	1000-1800, 2100-0100
,,	,, W1	0100-0600, 1100-1600
,,	,, VK9	2000-1400, 1600-1800
,,	,, PY	2100-0200, 0500, 1000
,,	,, W6	0200-1200, 1400-1800
,,	,, JA	0600-1600, 2000-2300
,,	,, 9G1 S.P.	2200-0200, 0500-0900
,,	,, ,, L.P.	0200-1000
VK3	,, SU	2200-0400, 1800-2000
,,	,, ZS	0400-1100
,,	,, G S.P.	1200-1900, 2100-0200
,,	,, ,, L.P.	2100-1000
,,	,, UA	1000-1900, 2100-0200
,,	,, PY	2200-0200, 1000
VK4	,, SU	2100-0200, 1200-1800
,,	,, ZS	0400-1300
,,	,, G S.P.	0800-1700, 2100-2400
,,	,, ,, L.P.	2000-1000
,,	,, UA	0900-1700, 2100-0100
,,	,, PY	2000-0200, 0500, 1000
VK5	,, SU	1200-0400
,,	,, ZS	0400-1100
,,	,, G SP.	1200-1900, 2200-0200
,,	,, ,, L.P.	2100-0400, 0600-1000
,,	,, UA	1000-1900, 2200-0200
,,	,, PY	1000-1100, 2300-0200
VK6	,, SU	2400-0400, 1200-1800
,,	,, ZS	0400-1200
,,	,, G S.P.	2400-0400, 1300-1800
,,	,, ,, L.P.	2300-0200, 0600-1100
,,	,, UA	2300-0300, 1100-1800
,,	,, PY	2400-0300, 0900-1200
7 MHz		
VK2	,, SU	1600-2200
,,	,, G S.P.	1800-2100
,,	,, ,, L.P.	0600
,,	,, KH6	0700-1700
,,	,, ZS	1400-2200
,,	,, UA	1500-2100
,,	,, PY	0600-1000, 2000-2100
VK6	,, SU	1600-2400
,,	,, G S.P.	1800-2300
,,	,, KH6	0900-1700
,,	,, ZS	1400-2400
,,	,, UA	1600-2300
,,	,, PY	1900-2400

Smoothed monthly Sunspot number Predictions for May 36, June 34, July 32, August 30. Smoothed mean for July 1972 — 68.1, August 1972 — 65.4

Swiss Federal Observatory, Zurich.

Letters to the Editor

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers.

The Editor A.R.
Dear Sir,

I noticed in Feb A.R. that there was a notice requesting comment on the disappearance of the prediction charts.

I made great use of these and I am sure that lots of others will miss them — even if they don't write.

After all, we all have to use the Ionosphere and the predictions are pretty good on the average and they are meant to tell us average conditions. I prefer the old charts, but computer output would be fine if that is cheaper — As long as we get the information in some form or other.

Yours
D. S. Robertson VK5RN

The Editor A.R.
Dear Sir,

Re Ionospheric Predictions (without blocks).

These are useful indications of what might be worked. However, I have not used them very much. I only work DX when it and I are on together. I don't get into America or Europe very often, indeed Western Australia seems to be the end of the world as far as DX is concerned. The notable exception is the VK/ZL Oceania contest when I have heard many Europeans calling "CQ VK".

The predictions would probably be of much more practical use to a regular service relaying RTTY news, or picturegrams all over the world, but I would like to see it continue, as in Jan 1973 A.R.

Yours
Jon Kitchin VK6TU

The Editor, A.R.
Dear Sir,

Reference your par., Page 16 of "A.R." February '73, I would like to assure you that the Prediction Charts are of considerable interest and importance as a DX aid to anyone interested in long distance communications.

Rather than waste time in considering the deletion of this important feature of "A.R.", I would like to suggest that serious consideration should be given to reverting to the former chart type of presentation which conveys far more relevant information than the present numeric style.

"A.R." is a credit to all those concerned in its publication, therefore let it remain so by discarding any form of negative thinking.

Yours
Alf Matthews VK3ZT

The W.I.A. now receives computer-print charts. With maximum reduction only 12 could be fitted into a single column thus a complete page of A.R. would be required for reasonable coverage and appropriate explanations. It is regretted that this would occupy too much space at present — Ed.

OSCAR-6

Writing on 13th March, VK5ZHJ reported 202 QSO's with 45 different stations up to orbit 1875 and he had logged 69 stations including KX6HK on orbit 1749.

WHY WE BELONG — ONE GOOD REASON

Extract from a letter requesting pensioner re-grade. "Apart from the fact that I, like others, believe we should all be members of the Institute for the general advancement of Amateur Radio, and it is money well spent, I have no other requirement with the exception of the A.R. publication." Many other members have expressed similar sentiments. Thanks OM.

INTRUDER WATCH

With Alf Chandler,* VK3LC

The following text of a letter received from Dick Baldwin, WIRU, Asst. Gen. Manager of ARRL, is interesting enough to reproduce in its entirety —

"Many thanks for your June-December summary of Intruders. I will forward a copy of this to FCC, as usual, because they find it helpful to match up with the reports filed by ARRL.

"Our volume of reports filed continues to run very high, and our FCC continues to file many, many official complaints with the administrations concerned. Some of the complaints are successful, some are not, but we are pleased that we get such excellent co-operation from the Commission. K1CLM, W1NF and K6KA continue to be the largest individual contributors of reports, but I have so many smaller contributors that the total volume continues undiminished. The only problem I have not solved is how to arrange for the time to produce a summary similar to yours that I could furnish to people like yourself, G3PSM and K6KA.

"In the months ahead the operation of the Intruder Watch is going to gain increasing importance, as there now begins to be some indication that there may be an HF WARC in 1978-80. A number of government committees have been formed here to study the future spectrum needs of various services, including amateur, and the League will be stepping up the tempo of its preparation. The overall success will, of course, depend on the leadership of societies like the WIA and the dedication of individuals like yourself."

This is explanatory enough to make you all sit up and take notice. If we don't do something about it our bands will be cut again in 1978. How about that?

A welcome advangement for the Intruder Watch is the appointment of two more Co-ordinators in the persons of Ross Greenaway VK6DA and H. Hancock VK7MZ. We welcome these two gentlemen wholeheartedly. This completes the states Co-ordinators, and I list them below. Now it is the responsibility of all Members to rally around their Co-ordinators, and supply them with reports of intruders heard. That is the life blood of the Intruder Watch, and cannot be stressed too often by me or by anybody else.

The Co-ordinators are as follows —VK2ZO — Bill Jenvey, 9 Forsyth St., Willoughby, N.S.W. 2068. Albert Cash, 20 Alemein St., Morwell, Vic. 3384.
VK4KX — Murray McGregor, 6 Murray St., Red Hill, Q'land. 4059.
VK5LG — Leith Cotton, 64 Weeroona Ave., Parkholme, S.A. 5043.
VK6DA — Ross Greenaway, 22 Salisbury St., Leederville, W.A. 6007.
VK7MZ — H. Hancock, 6 Hgh View Cres., Devonport, Tas. 7310.

Get in touch with these gentlemen at any time when you require any information on Intruder Watch matters.

A station heard recently on 14010 KHz uses the call-sign of 3DN and sends weather reports in English for various Pacific Islands. We think that it is a legitimate station transmitting on its correct frequency but emitting a spurious signal. It has been reported by VK4 Members, but I would like reports from observers in other states.

*Federal Intruder Watch Co-ordinator, 1536 High St., Glen Iris, Vic. 3146.

NEW CALL SIGNS

DECEMBER, 1972

VICTORIA

VK3LJ—A. A. Solomon, 428 Ligar Street, Ballarat, 3350.
VK3APB—M. J. Williams, 9 Monteith Ave., Flora Hill, 3550.
VK3AKR—"KALORI" AMATEUR RADIO CLUB, 26 Lee-Anne Crescent, Bundoora, 3083.
VK3ASR—3RD SIGNALS REGIMENT AMATEUR RADIO CLUB, Albert Road, South Melbourne, 3205.
VK3BJM—J. D. McNally, 3 Avondale Grove, Mount Waverley, 3149.
VK3BKR—K. R. Baker, 12 Havelock Street, Maidstone, 3012.
VK3YJG—G. R. Hedley, 15 Strasboure Road, Rosanna, 3084.
VK3YHS—G. H. Smith, 18 Elwood Street, Surrey Hills, 3127.
VK3YIC—I. F. Collier, 123 Foster Street, Ballarat, 3350.
VK3YJA—J. A. Matheson, 30 Millers Road, The Basin, 3154.
VK3YJS—J. A. Sanlaureano, 100 Murray treet, South Caulfield, 3162.
VK3ZAW—B. A. Walters, 1/13 Edwin Street, East Preston, 3072.
VK3ZBR—C. H. Reid, 16 Fyfe Avenue, Ringwood, 3134.
VK3ZCS—G. G. Baker, 4/71 Medway Street, Box Hill North, 3129.
VK3ZEK—A. Groen, 97 Waters Drive, Altona, 3018.
VK3ZFG—A. Chisolm, 120 Gower Street, Preston, 3072.
VK3ZFJ—A. M. Tilley, 19 Wallace Street, Toorak, 3142.
VK3ZGW—G. G. Williams, 1 Manna Gum Road, Ferntree Gully, 3156.
VK3ZHI—B. O. Marsh, 3 Ann Court, Aspendale, 3195.
VK3ZIL—P. A. Elton, 6/1328 High Street, Malvern, 3144.
VK3ZIO—D. A. Fraser, 8 Castles Road, Moorabbin, 3189.
VK3ZOP—I. D. Phelan, 11 Michael Street, Bendigo, 3550.
VK3ZQP—G. P. Percy, 22 Cotswold Crescent, Springvale South, 3172.
VK3ZWS—W. I. A. Stone, 20 Bristol Avenue, Chelsea, 3196.
VK3ZBQ—B. R. Bailey, Residence No.5, Mildura Airport, 3500.

QUEENSLAND

VK4IU—R. Miller, 3/18 Glena Street, Fairfield, 4103.
VK4JU—J. M. Joughin, 12 Attunga Crescent, Buderim Mountain, 4556.
VK3KE—M. R. Temple, 7 Floyd Street, Woodridge, 4114.
VK4KF—J. S. Temple, 7 Floyd Street, Woodridge, 4114.
VK4OZ—H. Cox, 32 Bellew Street, Wynnum North, 4178.
VK4PF—I. M. McCosker, 2 Lennie Avenue, Main Beach, Southport, 4215.
VK4XT—J. M. Taylor, 26 Patrick Street, Dalby, 4405.
VK4ZIK—K. Bouchard, 107 Hurdcotte Street, Enoggera, 4051.
VK4ZKB—K. L. Feltham, 3 Murray Street, Clontarf, 4019.
VK4ZKM—K. L. Marschke, 26 Howard Street, Gaythorne, 4019.
VK4ZMY—B. D. Mathieson, 108 Cutbush Road, Everton Park, 4053.
VK4ZNI—N. I. Lynch, 15 Noeline Street, Dorrington, 4060.
VK4ZSH—S. J. Hutcheon, 72 Jubilee Terrace, Ashgrove, 4060.
VK4UJ—J. E. Burnham, Burnham Street, Forest Hill, 4342.

SOUTH AUSTRALIA

VK5NI—A. J. Cannon, 30 High Street, South Brighton, 5048.
VK5NV—A. L. Harper, Station: Bayview Road, Stansbury South. Postal: P.O. Box 45, Stansbury, 5582.
VK5ZAJ—B. H. Buchanan, 2/72 Ninth Avenue, Joslin, 5062.
VK5ZDO—G. Baczocha, 3/92 Seventh Avenue, St. Peters, 5069.
VK5ZJA—N. J. Abraham, 41 Jetty Street, Grange, 5022.

WESTERN AUSTRALIA

VK6HO—J. D. Holt, 109 Forrest Street, Cottesloe, 6011.
VK6UG—J. H. W. White, 198 Brookdale Street, Floreat Park, 6014.
VK6ZFC—P. J. Fall, Currie Hall, Winthrop Avenue, Crawley, 6009.

TASMANIA

VK7LP—P. L. Dazeley, 5 Stroke Street, New Town, 7008.

TERRITORIES

VK9CW—R. W. Coulter-Thurley, Postal: P.O. Box 799, Port Moresby. Station: Tradewinds Flat No. 5, Airvos Avenue, Port Moresby.
VK9ZLG—G. J. Leedham, Postal: C/- P.O. Box 2087 Konedobu. Station: D.C.A. Aviat Mess, Konedobu.
VK9ZJT—T. S. H. Jones, Postal: C/- P.O. Box 335, Port Moresby. Station: C.D.W. House 8, Badili Hill, Port Moresby.

Magazine Index

With Syd Clark, VK3ASC

SHORT-WAVE MAGAZINE. December 1972.
Useful General Purpose PSU.; Terminal Unit in Solid State for RTTY.; Two-Metre FM with the FT-101.; Multi-Band Aerial for Restricted Space. January 1973.
QRP Transmitter Circuits.; Frequency Modulation.; Speech Compression Unit.; Solid State Receiver for Two Metres.;
RADIO COMMUNICATION. January 1973.
The G3TDZ Portable 2M Transmitter/Receiver, Mk.4.; Amateur Bands in the U.K. (Effective January 1973).; Decimal Point Switching on DFM's.; The Barlow Wadley XCR-30 Mark 2 Receiver.; Technical Topics this month deals with a tripler power supply which gives 900 volts DC straight off the AC mains.; a 200 MHz scaler, and single band three element quad.; Microwave series continues. CQ.TV. November 1972.
For the TV buff there is a video line amplifier; Amateur Colour (Pt. 4).
VHF COMMUNICATIONS. November 1972.
VHF Transequatorial Propogation.; An Integrated Receiver System for AM, FM, SSB & CW.; Dimensioning of Microstripline Circuits.; A Stable Crystal Controlled Oscillator (10-) for Frequency & Time Measurements. Amateur Television Pt. 3.
73 MAGAZINE. December 1972.
The AFSA IV SSTV Analyser.; Single Conversion Two Metre FMreceiver.; The MOS-Tone Encoder.; A Short Tone-Burst Decoder.; A Universal IF Amplifer for Standard or Panoramic Receiver.; Touchtone and Telephone Connecting Arrangements.; The Simplest Audio IC yet!.; Sideband Sniffer.; Crystal Frequency and Activity Checker.; 10 amp Variable Power Supply.; Transmission Line Sections.; Radio Astronomy for Radio Amateurs.; Direct Reading Inductance Meter.; Transverter for 20 metres.; A Primer on LEDs.; Forty Metre FET Preamplifier.; Liquid Plastic Waterproofing.; Improved Circuitry for KTI CW Filter.; A Transistorised VFO.
73 MAGAZINE. January 1973.
Handi-Talkie Touch-Tone.; How to Win in the Pileups.; In the Halls of the Giant Yaesu Establishment.; Another Integrated Circuit Frequency Counter.; An Improved Audio Speech Processor.; A Two-Tone Test Generator.; Speculations on Future DX.; FM Test Set.; DX-Missing Made Easy.; Installation and Method of Tilting a 60 ft. Tower.; Amateur Licensing in Japan.; Six Metre Converter using International Crystal Kits.; The Wife, The Ham, and the Other Woman.; Tunable Audio Filter.; Six Hand Linear at 5c per Watt.; Current Gain in High Power NPN Silicon Transistors.; IC Ten Metre Tuner for Use with Solid State VHF-UHF Converters.; A Different Method of Quad Construction.; Improving the Drake R4A Receiver.; Another Hedge Clipper.; Designing an Improved AGG System for CW & SSB Reception.
QST. January 1973.
A 40 metre CW Receiver.; A Linear Field Strength Meter.; Crossed Yagis for Circular Solarization.; The F2TU for VHF FM RTTY.; A CB Rig for 220 MHz.; A Simple Keying Monitor.; 160, 75 and 40 metre Inverted Dipole Delta Loop.; Review: Swan Twins (600-T and R).; Heath HW-7 CW QRP Tcvr.

AWARDS COLUMN

With Geoff Wilson,* VK3AMK

AUSTRALIAN D.X.C.C.

PHONE

VK6RU	318/347	VK2APK	299/309
VK5MS	316/343	VK5AB	294/314
VK4KS	314/331	VK4PX	292/296
VK3AHO	307/326	VK4UC	291/293
VK6MK	304/328	VK4FJ	286/310
VK4VX	302/305	VK4TY	282/288

Amendments: VK5WV 150/151 VK4RF 251/252

VK3AHO	306/326	VK3NC	271/297
VK2QL	301/327	VK6RU	265/291
VK3YL	293/313	VK3YK	261/281
VK2APK	291/301	VK4VX	261/263
VK4FJ	291/320	VK4TY	256/272
VK3XB	283/300	VK3TL	251/260

OPEN

VK6RU	318/345	VK4VX	308/311
VK4SD	316/334	VK6MK	304/328
VK4KS	315/336	VK4TY	303/321
VK2VN	310/332	VK4FJ	300/329
VK2EO	309/325	VK4UC	300/303
VK2APK	308/323	VK2SG	299/306

Amendments: VK4RF 273/287 VK4PX 299/307

AMENDMENTS TO AUSTRALIAN D.X.C.C. COUNTRIES LIST

NEW COUNTRY: MT. ATHOS — THEOCRATIC STATE WITHIN GREECE. Credit is now being given for Mt. Athos as a separate country and SY1MA cards submitted have been added to Members DXCC totals.

DELETED COUNTRY: SWAN IS (KS4). This country has been deleted from the list as from September 1, 1972. All future contacts with Swan Is. will count as for Honduras. All Members claiming Swan Is. have had their DXCC totals adjusted.

*Federal Awards Manager, C/- P.O. Box 150, Toorak, 3142.

Afterthought.
March A.R. Page 7 Table 1 third column for "Radius" read "Diameter".

HAMADS

For Sale

Collins KWM2, 516F2 Power Supply — latest model 240 volt operation, and complimentary Collins linear amplifier. As new. Both in immaculate condition with extremely little use. Rare opportunity. Roth Jones, 1 Albert Road, Melbourne, 3004.

Brand new 6B5, 6A6, 6AG7, 6N7, 3Q5, EBC33, 6H6, 266, 9003, 6130, 6BA6, 6EA8, 6AL3, 1B3GT, 6J6, 21A6, X78, 6CW7 also 2 x 4-1000A offers: 1 x 4CX250B and new socket unused $8, 1 new QEO 5/40 $4, 1 new 2E26 $3, DET24 new $1.50, 832 50c, QQV03/10 new $3, 852 $2, 7 x FT243 x tl 8-9 MHz offers, TY2/125 50c. All must go. H. Leupold, 9 Hland Ave., Darlington, S.A. 5047.

"AWA 5"-CRO, fair condition, $40 or best offer. Ph. (03) 89 9017 (John).

Double conversion amateur band receiver. Crystal locked, turrett tuned front end. 80 to 10 metres. Crystal lattice filter. Eddystone dial. B. White VK2AAB, Ph. (02) 487 1428.

Must sell KWM2 now at Collins Radio Co. Victoria — being overhauled and completely modernised. Will be in perfect condition and with all Service Bulletins to date — complete with Clip-on Power Supply — USB-LSB-Calibrator — beautiful job. Price $1100. Packed 4 and O. R. Gympie. VK4LN QTHR.

Galaxy GT550 Transceiver with Galaxy 550 240V power pack and speaker, 4BTV vertical aerial. All complete with mike and coaxial cable. Reason for selling. Unable to complete course at W.I.A. due to business reasons. All new in original cartons — $950. J. Burns, 1046 Barrenjoey Road, Palm Beach, N.S.W. 2108. Tel: 919 4003.

Heavy duty Collins 12V DC power supply 516E suitable KWM2 good condition. Original cost $400 now $180. A. Swinton VK2AAK, P.O. Box 1, Kulnura, N.S.W. Ph. 76 1261.

Megacycle meter 420-960 mcs. Model 59UHF Oscillator. Use as GDO for UHF. Made by Measurements Ltd., USA. As new, complete with power supply and instrument. $90. A. Swinton VK2AAK, P.O. Box 1, Kulnura, N.S.W. Ph. 76 1261.

CC2 Carrying Case for Collins Equipment KWM2, 3OL1, 51SL, 62S1. Cost $85 now $50. A. Swinton VK2AAK, P.O. Box 1, Kulnura, N.S.W.

Akai X4 Stereo or Mono tape recorder cross field type battery or AC operated. Tape speeds 15/16, 1⅞, 3¾, 7½. Complete with 2 Akai mikes and Akai AC adaptor. $145. A. Swinton VK2AAK, P.O. Box 1, Kulnura, N.S.W. Ph. 76 1261.

AWA car phone with Channel A & B plus crystals, good order. MR20A. $50. A. Swinton VK2AAK, P.O. Box 1, Kulnura, N.S.W.

Solid State HT supply 750V 150 ma. cont. 255 volt 125 ma. regulated, 6.3V 3 ma-110/240 input. $50. A. Swinton VK2AAK, P.O. Box 1, Kulnura, N.S.W.

Ameco transitorized converter model CHT2 for VHF to broadcast band 12V. $30. A. Swinton VK2AAK, P.O. Box 1, Kulnura, N.S.W.

Quantity of radio parts and units. Write for list. VK2QB QTHR.

Vinten. BTR1OR Fixed Station Unit. Six Channel. Crystals for A.B.I. & 4. Inst. Preamp. and Disc. Meter installed. Excellent condition. $110. ONO. VK3BAX. QTHR. Ph. (052) 95949 Bus. 97401 A.H.

Complete Station, comprising KW 2000A Transceiver 160m through to 10 $495, KW E-Zee Match $34, KW SWR Meter $19, KW52 ohm Dummy load $15, BC 221 Frequency meter with charts &, P.S.U. $27, 'A' Frame wooden tower plus 20ft pole $30, TA 32 3 band beam $50, TR 44 Rotator plus ind'ctr. $80. VK3AXO Ph. (03) 723 4279.

A.W.A. Universal Bridge A56048 and Manual. Several loudspeakers to 10" various. Offers please, deceased's estate. 12 First St., Ashbury, N.S.W. 2193.

Wanted

Required 5th Edition A.R.R.L. Handbook — Any reasonable price paid or 1973 handbook — contact VK2SK — Urgent. QTHR

Enthusiast requires early Radio Sets, valves, parts, speakers and books prior to 1930. Good prices paid. Details to Edgar Road, San Remo, 3925. Phone 107. M. O'Brien, Experimental VK30.

Morse keys wanted for W.I.A.—Y.R.C.S. Victoria Division students — please write VK3AH, Box 39, Mooroolbark, 3138.

By 80 year old blind ham-transceiver or AM transmitter 7/14 MHz. Condition unimportant. W. J. Zech, C/- The Burlington Rest Home, Main St., Katoomba, N.S.W. 2780.

Deltahet or similar H.F. Receiver, with 1 MHz bandspread and variable IF bandwidth. A. Brodie. Ph. (02) 498 3036.

A.R. September to December 1969. Buy or borrow. VK2TR QTHR.

Pye 9-0A or similar 9 MHz filter with or without carrier Xtals. Price and details to VK3AOH QTHR. Ph. 49 6224.

Data on UN Bendix Rx, data and circuit or handbook for No. 62 set, No. 19 set, AMR300, CR100. Also wanted teletype page printer. Will reply all letters. H. Leupold, 9 Hyland Ave., Darlington, S.A. 5047.

KEY SECTION

With Deane Blackman,* VK3TX

My apoligies to readers of this column for its absence over the past few months. I am glad to say that me and my files are all now re-united back in Melbourne, and I hope to maintain contributions on a regular basis again. If you have any information which might be of interest to CW operators please let me know.

The most exciting development over the past couple of months has been the establishment of a CW net on Sunday morning. VK4II, among others, has been active in setting this up. Everyone is invited to participate — you do not have to be a Key Section member.

The frequency is 7025 KHz, from 0930-1130 each Sunday. The net control station (NCS) calls CQ CWN, and you should in joining give your name and preferred operating speed. 10 wpm ops are welcome — be assured NCS will slow down for you. Subsequently NCS will offer you a frequency and station for a QSO.

NCS is using the "QN" signals for net control. These are listed in American amateur publications, but in case you do not have access to these I will list them in this column over the next month. The most commonly used are:

QNI Net stations report (call by NCS) I am reporting in
QNJ Can you copy me? Can you copy ...?
QNO Station is leaving net
QNP Unable to copy you (or ...)

All usual "Q" codes are used too, of course.

There is at the moment only one net operating. If support warrants it I imaging more than one may become necessary. So, join in, enjoy the fun of CWN operating, and swell the CW traffic on 40. CU Sunday?

*Box 382, Clayton, Vic., 3168.

WHY NOT TRY DOUBLE SIDEBAND?

(continued from page 19)

NETTING

If you hear an ssb operator and wish to net to his frequency, merely use your VFO to resolve his speech. Then you will be on his suppressed carrier frequency.

CONCLUSION

The transmitter can be used for C.W. on 14 MHz by switching to the Balanced condition and shorting out turns on the plate tank circuit inductor.

AR

SILENT KEYS

It is with deep regret that we record the passing of:

VK2ZW—A. J. Perkins

"20 YEARS AGO"

With Ron Fisher, VK3OM

The back cover presented the big news of May 1953. The introduction of the Geloso VFO. R.H. Cunningham Pty. Ltd., announced the arrival of the original 4/101 all band VFO unit. I guess that over the next few years almost every amateur in Australia purchased one of these units. I heralded the introduction of the all band table top transmitter to this country. Many of these are still in use, although the stability is not up to present day standards. I have one in daily use modified for the 160 metre band.

Editorially, concern was expressed about whether amateurs would be allowed to conduct on-air experimental transmissions, and which bands would be allocated for this. A special Multiband Antenna was described by Hans Albrecht VK3AHH. It consisted of two 67 foot sections, one horizontal the other at a 45 degree angle. By employing a separate feed system on each section, phasing could be changed to give different directive patterns.

Winners of the 1953 National Field Day contest were VK2ASW taking out both the open and phone sections, VK2ASJ won the CW section with VK3AHH winner of the fixed section, no doubt using the antenna described above.

Apparently the 1953 Urunga Convention was quite an affair. Almost one page was devoted to a report on the activities with Noel Hansen VK2AHH doing the reporting. Another page gave a running description of who toasted who at the Federal Council dinner for delegates to the Easter Convention in Melbourne.

Looking through the advertisements I noted the following bargains, Ham Radio offered AR8 receivers at 20 pounds. R1155 receivers at 29 pounds 10/- and an RA1B receiver at 35 pounds. In the Hamads a 2JU 8 valve receiver with coils for 80, 40 and 20 was offered for 'best offer'. News and technical articles must have been short in May 1953, the magazine ran only to 16 pages!

TECHNICAL AWARDS

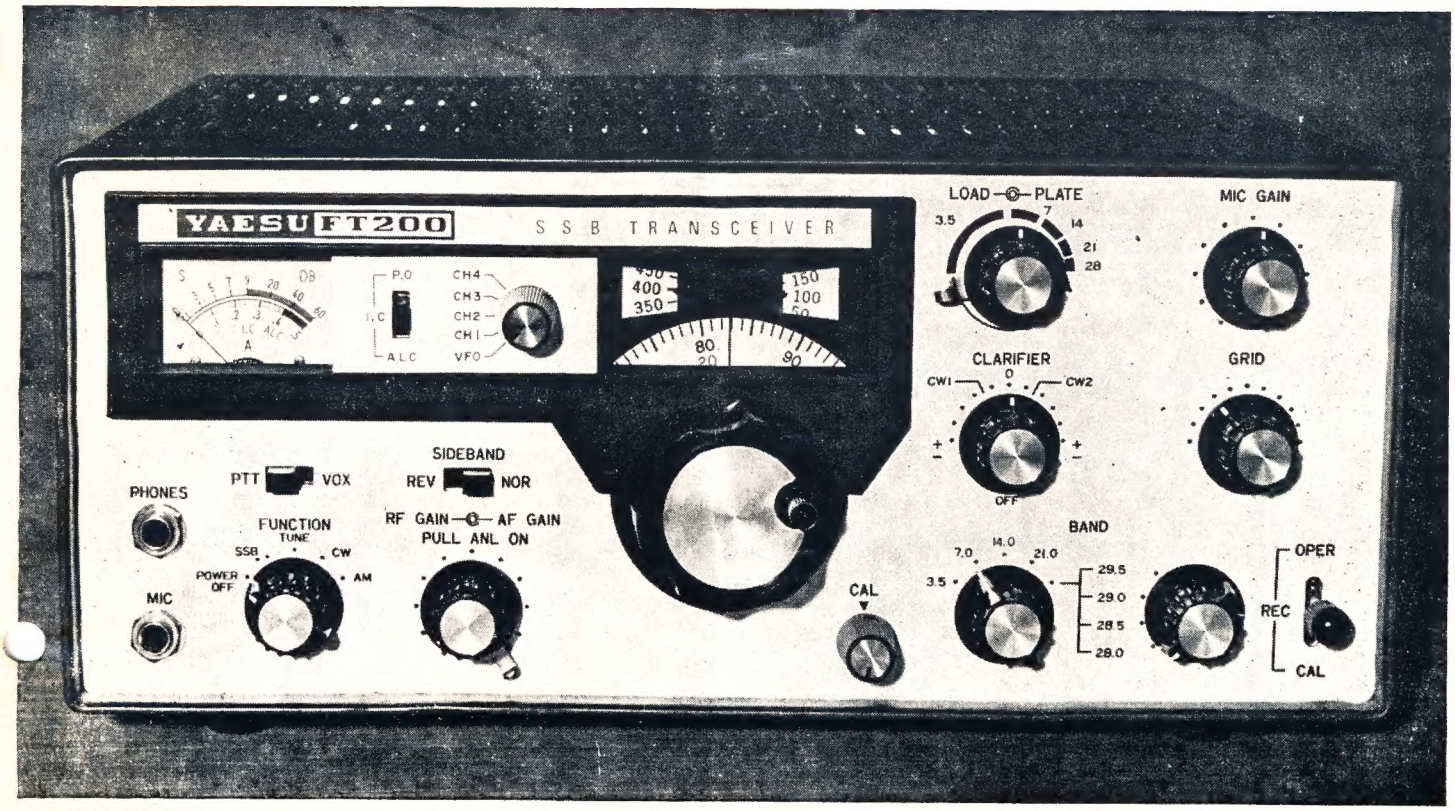
The Publications Committee have great pleasure in announcing that Awards for contributions in the interests of "Amateur Radio" for 1972 were decided recently after very considerable and extensive discussions.

These awards are known to be of considerable importance to authors and therefore consideration extended in depth to the merits of each article.

The following were decided:

Higginbotham Award: Chris Cullinan VK3AXU, as explained elsewhere in this issue.

Technical Award: Jointly to S. E. Molen VK2SG, for his article "I've built a Monster" in Dec. A.R. and R. L. Harrison VK2ZTB, for his articles on propagation in May A.R. and subsequent issues.



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FT-200 FIVE-BAND TRANSCEIVER

A superb quality, low cost, versatile transceiver. Covers 80-10 mx, tuning range 500 Kc. each band. On 10 mx, crystal supplied for 28.5-29 Mc. (Crystals available optional extra for full 10 mx coverage.) SSB, CW, AM; with a speech peak input of 300w. Transistorised VFO, voltage regulator, and calibrator. 16 valves, 12 diodes, 6 transistors. PA two 6JS6A pentodes. ALC, AGC, ANL, PTT and VOX. Calibrated metering for PA cathode current, relative power output, and receiver S units. Offset tuning ±5 Kc. Uses a 9 Mc. crystal filter with bandwidth of 2.3 Kc. at —6 db. Selectable sidebands, carrier suppression better than —40 db. Sideband suppression better than —50 db.

Provision for use of optional external VFO, FV-200. VFO includes fixed channel facility.

Operates from conservatively rated separate 230 volt 50 c.p.s. AC power supply, FP-200, which includes built-in speaker. A 12 volt DC power supply, DC-200, is also available. Transceiver incorporates power take-off and low level R.F. drive outlets suitable for transverters.

Latest model includes (1) provision for use of external VFO FV-200, and (2) factory installed key-click filter.

Cabinet finished in communication grey lacquer. Panel, etched, satin finish aluminium.

FT-200 Transceiver	$395
FP-200 AC Power Supply	$90
DC-200 DC Power Supply	$135
FV-200 External VFO	$115
M-200 Mobile Mount	$15

NOTE: Early model FT-200 owners, basic kit of parts available to enable modification for ext. VFO facility

Prices include S.T. Freight is extra. Prices and specs. subject to change.

All sets checked before despatch. After sales service, spares availability, warranty. All Yaesu sets sold by us are complete with plugs, power cables, English language instruction manuals, and three-core AC cable and 3-pin plug installed where applicable.

Sole Australian Agent:

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60 Shannon St., Box Hill North, Vic., 3129. Phone 89-2213

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South Aust. Rep.: **FARMERS RADIO PTY. LTD., 257 Angas St., Adelaide, S.A., 5000.** Telephone 23-1268
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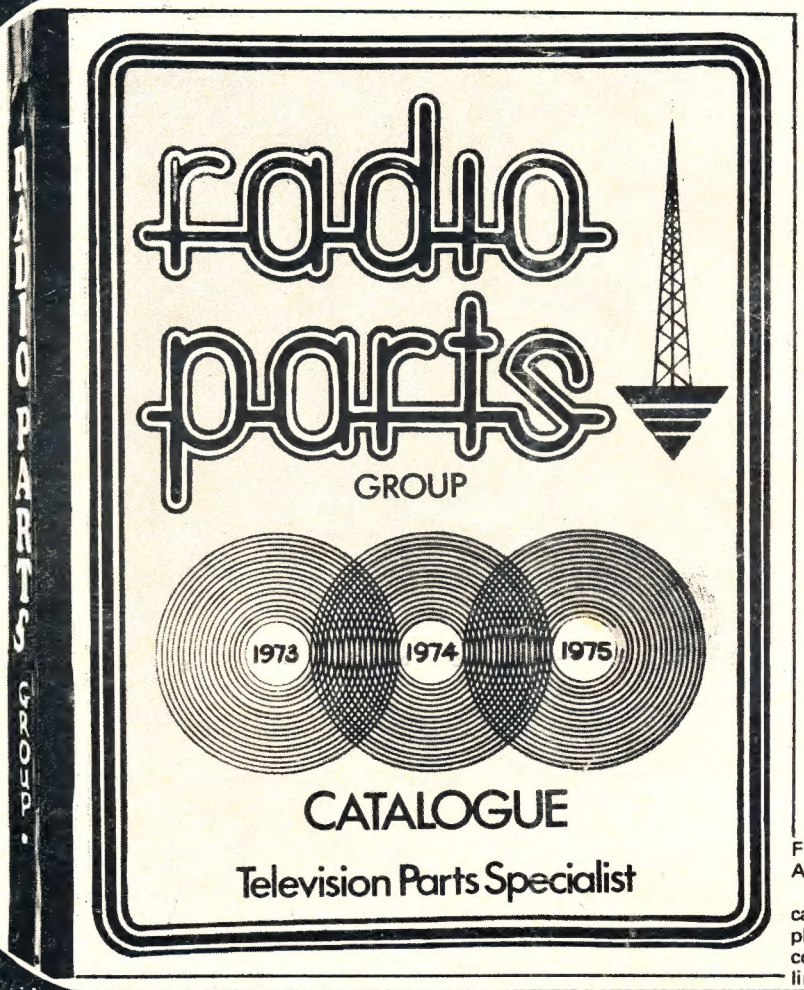

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